The Journal of Higher Education

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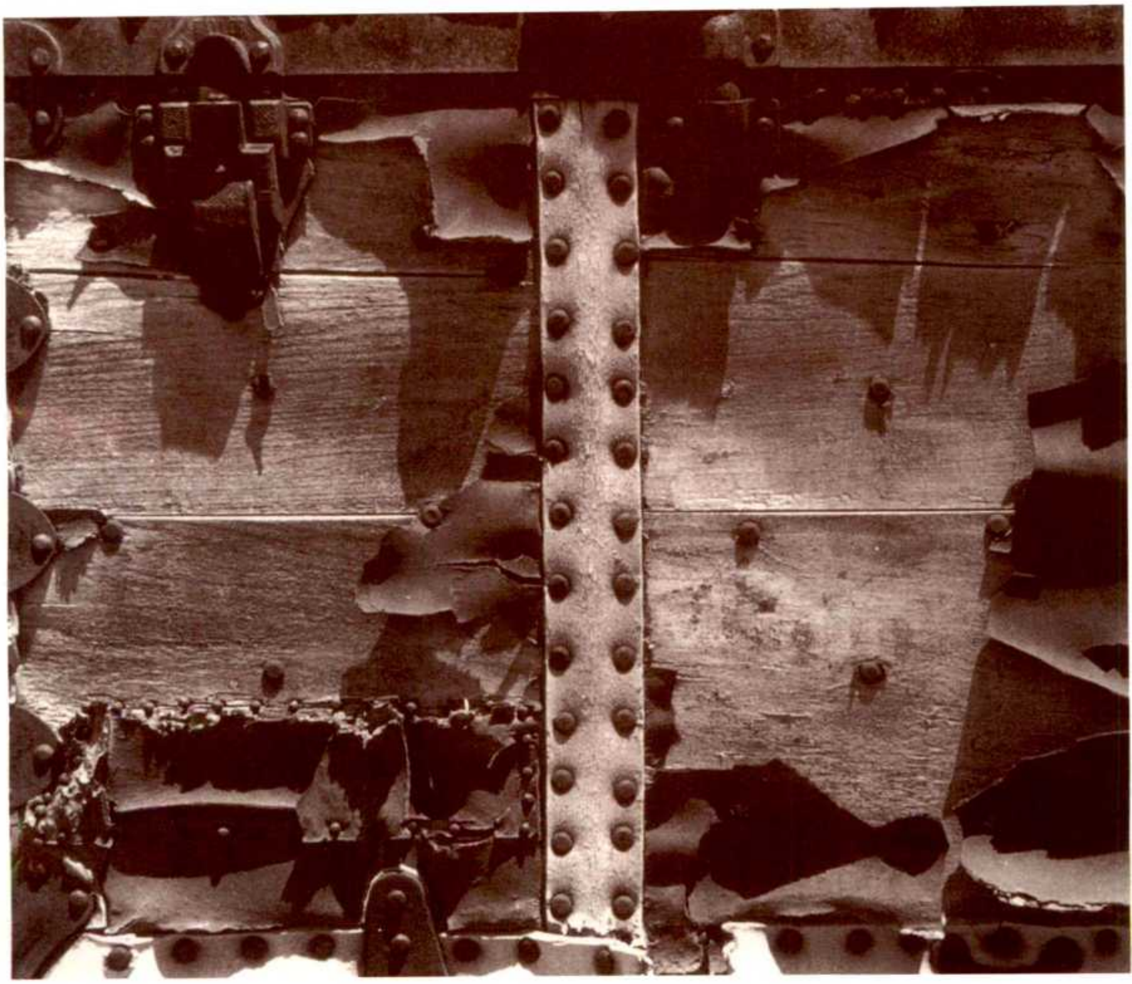

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JE January/February 1996
Vol. 67, No. 1

The Journal of Higher Education

A Note from the Editor on Change of Style 1

FLORA F. TIEN and ROBERT T. BLACKBURN 2

Faculty Rank System, Research Motivation, and Faculty Research Productivity: Measure Refinement and Theory Testing
This study explores the relationship between the traditional system of faculty ranks and faculty research productivity from the perspectives of behavioral reinforcement theory and of selection function. We generated and tested six hypotheses, using data from the 1989 Carnegie survey of faculty. The results failed to support completely either the reinforcement schedule theory or the selection function.

TRUDY W. BANTA, LINDA B. RUDOLPH,
JANICE VAN DYKE, and HOMER S. FISHER 23

Performance Funding Comes of Age in Tennessee
A survey of twenty-three college and university coordinators who conduct assessment activities and report findings in connection with Tennessee's fifteen-year-old performance funding initiative reveals strengths and weaknesses associated with ten indicators of institutional performance. Reasons for the longevity of this program, which was designed to serve both accountability and improvement purposes, are advanced.

SHELLEY M. PARK 46

Research, Teaching, and Service: Why Shouldn't Women's Work Count?
This article critically examines current university tenure and promotion criteria, suggesting that such criteria are both an effect and a source of gender bias in academia. It argues that current working assumptions regarding (1) what constitutes good research, teaching, and service and (2) the relative importance of each of these endeavors reflect and perpetuate masculine values and practices, thus preventing the professional advancement of female faculty, both individually and collectively.

W. CRIS LEWIS 85

Retirement Wealth, Income, and Decision Making in Higher Education
Retirement programs for college faculty are evaluated both in terms of their wealth-creation attributes and the incentives they provide for retirement. Wealth accumulation and relative cash flow from working compared to retirement are evaluated at various

ages under alternative assumptions about rates of return and contribution rates. The nature and effect of early retirement incentives also are considered.

LATIKA VASIL 103

Social Process Skills and Career Achievement among Male and Female Academics
Extending the application of self-efficacy theory, this study investigated self-efficacy beliefs for the social process skills relevant to an academic career and examined gender differences and the extent to which social process self-efficacy correlates with career achievement. Males were significantly more confident than females for social process skills; however, gender differences were not found after controlling for the effects of experience, academic rank and field, and institution. Social process self-efficacy explained a small but significant amount of variance in research productivity.

BOOK REVIEWS

Research Ethics: Cases and Materials, edited by Robin Levin
REVIEWED BY JOHN M. BRAXTON 115

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JHE May/June 1996
Vol. 67, No. 3

The Journal of
Higher Education

CLAUDIA E. NUNN 243

**Discussion in the College Classroom:
Triangulating Observational and Survey Results**

To examine classroom discussion, observations were made in twenty college classes and surveys were administered to 20 faculty and 566 students. Results indicated that little participation occurred and few students participated. However, teaching techniques (praise, probing for elaboration, repeating students' answers, using students' names, and correcting wrong answers) were found to correlate significantly with participation.

HERMAN AGUINIS, MITCHELL S. NESLER,
BRIAN M. QUIGLEY, SUK-JAE LEE, and
JAMES T. TEDESCHI 267

**Power Bases of Faculty Supervisors and
Educational Outcomes for Graduate Students**

The French and Raven power taxonomy (coercive, expert, legitimate, referent, and reward) was utilized to investigate graduate students' perceptions of their supervising professors' power and the relationship between professors' power and various students' perceptions, intentions, and behaviors. The results show that faculty power bases are related to several variables that are critical to student satisfaction and success.

GORDON SHEPHERD and GARY SHEPHERD 298

**War Attitudes and Ideological Orientations of
Honors Directors in American Higher Education**

Based on a 1991 national survey conducted during the Persian Gulf War, this study focuses on the political views and war attitudes of faculty who direct honors programs in the United States. Academic discipline and age cohort distributions are analyzed as possible explanations for directors' greater liberalism and dissent tendencies compared to other faculty. Also discussed are hypotheses regarding the possible accentuation of political attitudes in honors programs.

STEPHEN BELL 322

University-Industry Interaction in the Ontario Centres of Excellence

The development or enhancement of alliances among universities, industry, and government is widely seen as a prescription for strengthening the competitiveness of regional and national economies. This article examines the interaction of university scientists and industrial scientists in the Ontario Centres of Excellence and discusses whether the creation of these Centres should serve as a model for university-industry research linkages.

WONSEON KYUNG 349

In-Migration of College Students to the State of New York
This study investigates the determinants affecting the number of college student immigrants from other states to the state of New York. The present analysis, based on 1986 New York migration data, provides considerable evidence that student migrants' home state characteristics influence student migration. It also provides evidence on educational policy implications.

REVIEW ESSAY

The Contradictory College: The Conflicting Origins, Impacts, and Futures of the Community College, by Kevin J. Dougherty
REVIEWED BY BARBARA K. TOWNSEND 359

BOOK REVIEWS

The Law of Higher Education: A Comprehensive Guide to Legal Implications of Administrative Decision Making (Third Edition), by William A. Kaplin and Barbara A. Lee
REVIEWED BY MICHAEL A. OLIVAS 365

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JE July/August 1996
Vol. 67, No. 4

The Journal of Higher Education

WILLIAM ZUMETA 367

Meeting the Demand for Higher Education Without Breaking the Bank: A Framework for the Design of State Higher Education Policies for an Era of Increasing Demand

This article offers a model of state policymaking as it affects private higher education. It advances three constructs of policy postures: *laissez-faire, central-planning, market-competitive*. It explores empirically the relationships of the policies and postures to state characteristics and policy outcome proxies and draws policy implications. The analysis suggests that *market-competitive-oriented* policies are likely to be cost-effective for most states.

FRANCES K. STAGE and NANCY V. MILNE 426

Invisible Scholars: College Students with Learning Disabilities

This study employed ethnographic techniques to study eight university students with learning disabilities. Three categories of themes emerged that related to experiences in the university. Students described dispositional factors related to their learning disabilities, institutional factors, and implications of these factors for their college study.

YANGJING LIN and W. PAUL VOGT 446

Occupational Outcomes for Students Earning Two-Year College Degrees: Income, Status, and Equity

Among 1972 high-school graduates, having a two-year college education culminating in a degree or certificate (as compared to entering the labor market with no postsecondary education) improved *individuals'* occupational outcomes (income and/or job status). But two-year college education left patterns of inequality between *groups* unchanged at best.

BOOK REVIEWS

The University as an Institution Today, by Alfonso Borrero Cabal
REVIEWED BY REGINALD NNAZOR 476

Strengthening Collegiate Education in Community Colleges, by Judith S. Eaton
REVIEWED BY MARK OROMANER 478

Academic Libraries: Their Rationale and Role in American Higher Education, edited by Gerard B. McCabe and Ruth J. Person
REVIEWED BY ETHELENE WHITMIRE 481

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JHE September/October 1996
Vol. 67, No. 5

The Journal of Higher Education

ROBERT C. NORDVALL and JOHN M. BRAXTON 483

An Alternative Definition of Quality of Undergraduate College Education: Toward Usable Knowledge for Improvement

This article critiques traditional approaches to defining academic quality and offers an alternative perspective that overcomes the limitations of the traditional approaches. This alternative approach proposes that academic quality should focus on fundamental course-level academic processes and that quality of such processes is defined as the level of understanding of course content expected of students.

SUSAN B. HANNAH 498

The Higher Education Act of 1992: Skills, Constraints, and the Politics of Higher Education

The adoption of the Higher Education Act of 1992 (HEA '92) formalized a significant shift in federal financial aid policy from grants to loans. A case study of the federal policy-making process, HEA '92 illustrates how shifts in the power of actors and constraints in the environment shape policy outcomes.

DAVID KEMBER and JAN MCKAY 528

Action Research into the Quality of Student Learning: A Paradigm for Faculty Development

A case is advanced for educational action research projects for faculty development. In these projects participants examine and seek to improve selected aspects of their own teaching. Regular meetings allow for perspective transformation through discourse. Gathering interpretive data provides evidence to convince uncommitted departmental colleagues and can result in publications.

KENNETH D. STEWART, MARGARET M. DALTON,
GERI A. DINO, and STEVEN P. WILKINSON 555

The Development of Salary Goal Modeling: From Regression Analysis to a Value-Based Prescriptive Approach

Building upon multiple regression applications to salary equity issues, this article describes the development of a comprehensive, proactive, value-centered model for reviewing faculty salaries. Applications of the model in evaluating, redressing, and preventing salary equity problems are presented.

MORRIS A. OKUN, MARY BENIN,
and ANN BRANDT-WILLIAMS 577

Staying in College: Moderators of the Relation between Intention and Institutional Departure
This study tested hypotheses that the relation between intention (to stay or transfer) and institutional departure is moderated by semester GPA, commitment, and encouragement to stay. The results of a logistic regression analysis on 652 community college students indicated that the interaction effects of intention by commitment and intention by encouragement to stay both significantly contributed to the prediction of institutional departure.

BOOK REVIEWS

American Higher Education: A History, by Christopher J. Lucas
REVIEWED BY HAROLD PERKIN 597

Higher Education and Corporate Realities: Class, Culture, and the Decline of Graduate Careers, by Philip Brown and Richard Scase
REVIEWED BY JOHN S. HEYWOOD 599

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A Note from the Editor on Change in Style

For some years, the *Journal of Higher Education* has used a variant of the *Chicago Manual* style for its journal articles. The *Journal* is now changing to the *American Psychological Association* style for two reasons:

The first reason is the greater ease with which readers can assess the scholarship and argument of the articles. By having referenced articles with authors' names and dates of publication in the running text, the related work that the article is based on or is criticizing is apparent.

The second reason is ease of usage. Most contributors to the *Journal* are much more familiar with APA style and have found the translation process awkward.

Because a number of manuscripts that were prepared using the old style are already in production, articles using both styles will appear for several issues. However, authors are requested to use the APA style in all future submissions to the *Journal.* The new "Instructions to Contributors" in this issue incorporates this change.

L. L. B.

Flora F. Tien
Robert T. Blackburn

Faculty Rank System, Research Motivation, and Faculty Research Productivity

Measure Refinement and Theory Testing

Introduction

A system of faculty ranks serves as a hierarchical structure for faculty members to pass through during their careers. Each step represents a promotion that typically results in an upgrade of status and salary. In general, faculty performances on institutional criteria determine a faculty member's rank. Educational attainment, seniority, teaching, and service are some of the criteria. However, studies show that faculty research productivity is the major criterion for promotion in universities granting Ph.D. degrees [24, 27, 33, 36].[1]

Some believe that the possibility of promotion has a motivating effect on faculty research behavior. For instance, because of his worry about the aging effect on reducing the overall research productivity of American faculty, Tuckman [36] has suggested changing the academic reward structure by increasing the numbers of ranks that faculty can attain. In Ruscio's [32] interview study a faculty respondent commented about research publications: "Half to three quarters of what I read, if I asked myself why was this written, the answer normally is 'promotion'." Recently, in order to help faculty apply for more research grants and gain recognition from countries in Asia, the Pacific, and Europe, the University of Hawaii community colleges changed their only rank title of instructor to a system of faculty ranks like those of four-year institutions [31]. Even outside the United States, the Executive Yuan in Taiwan submitted a plan to the legislature to change their present rank

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Journal of Higher Education, Vol. 67, No. 1 (January/February 1996)
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system by adding a new rank level, thereby lengthening the faculty's research career ladder [18].

Whether or not, to what extent, and how promotion motivates faculty research behavior are the questions we investigate. We seek to understand more fully the motivating effect of rewards on faculty research behavior. Some scholars have suggested that intrinsic motivation (for example, research interest) rather than extrinsic motivation (for example, a promotion) plays the more important role in faculty research productivity [5, 19]. However, we argue that the intrinsic claim is open to doubt, because traditional faculty surveys possess imprecise motivation measures; moreover, they often lack of a theory base for generating hypotheses. On the basis of the efforts of measure refinement and theory testing, we utilize a theoretical framework and a generally accepted proposition for deducing testable research hypotheses. We employ behavioral reinforcement theory and selection function in order to study the relationship between a system of faculty ranks and faculty research productivity. We test six hypotheses and discuss the results. After summarizing the findings, we discuss some of the outcomes. Last, we note the study's research limitations and offer suggestions for further research.

The Literature

In the fields of higher education and sociology of science, scholars have identified many correlates of faculty research productivity [1, 2, 6, 8, 9, 16, 19, 21, 21]. Researchers frequently note academic rank and faculty research interest as two major correlates of faculty research productivity. Despite this research effort, findings regarding the relationships between rank, research interest, and faculty research productivity often conflict with one another.

First, the relationship of rank to research productivity is questionable. On the one hand, Bentley [6] and Blackburn, Behymer, and Hall [8] found rank to be a significant predictor of faculty research productivity. On the other hand, Guyer and Fidell [26], Over [30], and Wanner, Lewis, and Gregorio [38] showed that rank has no influence on faculty research productivity when other relevant variables are taken into consideration.

Second, whereas most studies suggest that research interest highly correlates with research performance [8, 22], one analysis of a recent national faculty survey shows that research interest does not predict publication well [9]. Also, research interest correlates negatively with research involvement [35].

Variations in study samples, differences in statistical techniques, and variations in the measures of faculty research performance probably all contribute to these contradictions. Moreover, along with the conflicting findings, there is the problem that the measures of the two correlates — rank and research interest — imprecisely measure motivation.

Imprecise Correlate Measure

Rank and research interest emerge in faculty studies as proxy measures of both extrinsic and intrinsic motivation. For example, given the evidence that publication does not stop at the full professor level when a promotion reward is no longer present, Finkelstein [19, p. 101] concludes that intrinsic rather than extrinsic motivation plays the preeminent role for publishing. By including research interest as one of the indices of intrinsic motivation, Behymer [5] tested the effects of intrinsic and extrinsic motivation on productivity. He too concluded that intrinsic rather than extrinsic motivation determines faculty research performance.

However, both Finkelstein's and Behymer's claims seem premature. With regard to Finkelstein's inference, we know that faculty members within the same rank differ from one another in the number of years they have been employed. In order to observe more accurately how faculty differ on productivity over time, a better measure would be years since promotion than rank per se. Because a pattern of rise and/or fall on productivity may exist each year within a rank over time, the aggregated measure, rank, results in the loss of important information.

Similarly, the intrinsic motivation measure Behymer employed is imprecise. The traditional measure of research interest in faculty surveys (including Behymer's) asks faculty the following question [12, 13, 14, 29]: "Do your *interests* lie primarily in teaching or in research? (1) Very heavily in research; (2) In both, but leaning toward research; (3) In both, but leaning toward teaching; (4) Very heavily in teaching."

Some challenge this survey question, which has been widely taken to measure intrinsic motivation, for its validity from different theoretical points of view. For example, Deci and Ryan [17], the proponents of cognitive evaluation theory, have pointed out that many nonintrinsically motivated behaviors may be characterized by "interest." From the modified expectancy theory's perspective [11, 23] one can argue that what the traditional question really measured is the relative motivation for a faculty person to pursue the first-level outcome (a particular behavior), given the choice between teaching and research. According to the modified expectancy theory, preferences for the first-level outcomes are influenced by second-level outcomes (intrinsic rewards and extrinsic rewards). However, the second-level outcomes usually are not measured in the traditional faculty survey. If a respondent chooses research over teaching, for instance, one cannot be sure whether it is because her or his intrinsic motivation for doing research is greater than that for teaching or because the overall effects of extrinsic and intrinsic rewards for doing research exceed those of teaching. Thus, by asking the traditional question, one has measured the relative strength of a faculty member's intrinsic motivation accurately only under the circumstance that the faculty member's valence of external rewards and the faculty member's instrumentality of performance for external rewards are the same for both teaching and research.

Equally important is the fact that motivation may change over time. Measuring motivation after the fact (publications as a dependent variable), as Creswell [16] has indicated, is methodologically problematic. Therefore, Behymer's claim that intrinsic motivation is more important than extrinsic motivation in conducting research is open to doubt for the following reasons: (1) the validity of the intrinsic motivation indicator is questionable; (2) one of his intrinsic motivation indicators failed in significance testing; and (3) methodological causal problems exist.

Though it is important to note the inherent measurement problems just discussed, the purpose of this article is not to debate which motivation, intrinsic or extrinsic, if either, plays the preeminent role in faculty research productivity. Rather, our goal remains the same — namely, to construct a better measurement of motivation, one that more accurately estimates the relationship between rank, motivation, and productivity.

Lack of a Theory Base

Another problem of traditional faculty studies is their lack of a theory base. Except for a few studies [9, 10, 28], most research on faculty productivity too often fails to anchor their study in a theoretical framework. Too frequently, researchers do not justify why they select a correlate, how one correlate connects with another, and what the relationships among correlates and productivity are. Because correlates can only represent the associations with, but not the cause of, faculty research productivity, one needs accepted theory in order to interpret the data.

Several theories can guide researchers investigating faculty productivity. From the behavioral reinforcement theory's perspective [15, 34], one can view a system of faculty ranks as a reward system as well as a schedule of reinforcement. As a reward, promotion has the greatest motivating effect when it is contingent upon performance. As a reinforcement schedule, the introduction of, and the removal of, promotion rewards influence publication rate and the shape of the productivity curve. Cognitive evaluation theory [17], on the other hand, suggests that extrinsic rewards may reduce intrinsic motivation. As a consequence, this relationship implies a possible negative effect of extrinsic reward on faculty research productivity. Expectancy theory [11, 23, 37] provides a rationale for how individual needs, values, and perceptions about the environment determine one's behavior. On the basis of that theory, a faculty member's motivation to conduct research will be greatest when he or she (1) believes research performance will lead to an outcome, (2) perceives the outcome to have a value, and (3) believes that with effort one will be able to perform at the desired level.

In this study, we chose the behavioral reinforcement theory to analyze the nature of a system of faculty ranks and to test its relationship with faculty research productivity. Because testing the cognitive evaluation theory and expectancy theory demand accepted measures of motivation, and because no good measures of intrinsic motivation and extrinsic motivation exist in the current faculty surveys, we set these two theories aside.

Theoretical Framework and Research Hypothesis

Faculty Rank System as a Schedule of Reinforcement

From the perspective of behaviorism [15] promotion is considered as having a motivating effect on productivity. Promotion upgrades the faculty member in status and pay. In addition, one can view the system of faculty ranks as an intermittent schedule of reinforcement. Under such a schedule, the desirable behavior (publishing) is not always reinforced by a promotion. The system of faculty ranks can thus be treated as one particular type of an intermittent schedule — the fixed interval schedule — because the desirable faculty behavior will not be reinforced until the passage of a specified period of time (time in rank requirement).

As a fixed interval schedule, theoretically, the system of faculty ranks should influence the productivity curve that is represented by the response rate of the research behavior and the length of the post-reinforcement pause. Based on the behavioral reinforcement theory [15], the expected publication rate remains low in the early period of the interval in rank because no promotion reward is conferred. Toward the end of the rank interval, the publication rate rises due to the closeness of promotion. In general, the nearer the time of promotion, the higher is the publication rate. After receiving the promotion, the theory predicts that the publication rate declines and a post-reinforcement pause occurs. The larger the time interval, the longer is the period of post-reinforcement pause and the lower the overall response rate. The productivity rate rises again as it moves toward the next possible promotion. Influenced by the timing of promotion, a cyclical behavior pattern occurs.

Although there is no statutory period of a seniority requirement for promotion in the United States, Bayer and Smart [4] found that the average years before promotion for American faculty is approximately six years. Furthermore, according to the agreement between the Association of American Colleges and the American Association of University Professors [3], the probation period for full-time faculty is not to exceed seven years. On the basis of these sources, we set the promotion interval at six years.

Viewing the system of faculty ranks as a schedule of reinforcement leads to three hypotheses about its relationships with faculty research productivity:

Hypothesis 1: Research productivity is low during the first few years for both assistant professors and associate professors because of the unlikelihood of a promotion as a reward for a publication.[2]

Hypothesis 2: Research productivity gradually increases as faculty approach possible promotion time.

Hypothesis 3: A post-reinforcement pause occurs after promotion. Research productivity declines as one begins one's associate or full professorship.

A System of Faculty Ranks and a Selection Function

Institutions promote productive faculty. Consequently, higher rank faculty members are academic "winners," individuals who have demonstrated their research ability. That is, a selection function is operating that eliminates those who do not succeed, namely, low producers. Scholars, however, have discussed this selection function from but a single point of view. For instance, Finkelstien [19, p. 97 suggested that promotion should raise a group's research productivity by the selection of individuals with research qualifications and orientation and by the elimination of those who do not have these qualifications. This leads to the following hypothesis:

Hypothesis 4: The higher the rank of faculty members, the more research they produce.[3]

Other consequences of the selection function, however, such as variability between ranks and variability within a rank, have not been examined. We deduce two other hypotheses in order to test if the selection function is successfully operating:

Hypothesis 5: Compared to faculty in a lower rank, faculty at a higher rank have less variability in their research performance.

Hypothesis 6: Faculty members who have lower productivity than do other faculty members in the same rank stay in a rank longer than the average.

Data Source and Research Design

Based on the criteria of employment status (tenured, or nontenured but in a tenure track), assistant, associate, and full professors from research I and II, doctoral I and II, and comprehensive I universities were selected from the unweighted 1989 Carnegie national survey data [14]. This produced 2,586 full-time faculty members.

We measured the dependent variable — faculty research productivity — by the number of publications during the two years prior to the survey. In order to test the different research hypotheses, the study employs several independent variables and statistical techniques as summarized in table 1.

We used the standard deviation to observe the variability of productivity within each rank. We employed the Bartlett-Box F test for homogeneity of variance to determine if any group variance significantly differs from the others. We used ANOVA to test differences among group means. We used the Studentized Neuman-Keuls (SNK) post hoc test because it provides a high degree of protection for the entire null hypothesis. Furthermore, it does not suffer from the overconservatism of the Tukey test caused by utilizing but a single critical value [25]. We include graphical displays because they suggest interpretations of behavioral investigations [15]. For each rank category, we grouped faculty members by years since promotion. We plotted the means for each year group with the years since promotion as the X-axis and publications as the Y-axis.

We used the chi square test for determining the degree of association between rank and discipline. The result showed that faculty members in different disciplines are distributed unequally in terms of their rank ($X^2 = 167.9, p < 0.001$). Consequently, we separately analyzed the different disciplines when testing hypotheses 4 and 5, in which rank serves as an independent variable.

TABLE 1
Independent Variables, and Statistical Technique for Each Hypothesis

Hypothesis	Testing Purpose	Independent Variable	Statistical Technique
Reinforcement Schedule			
Hypothesis 1	Observe if low productivity occurs during the early years before promotion distributes	Years since rank	ANOVA SNK post hoc test Graph observations
Hypothesis 2	Observe if productivity rises towards possible promotion	Years since rank	ANOVA SNK post hoc test Graph observations
Hypothesis 3	Test if postreinforcement occurs after promotion	Year since rank	ANOVA SNK post hoc test Graph observations
Selection			
Hypothesis 4	Test if the higher the rank, the higher the research productivity	Rank	ANOVA SNK post hoc test
Hypothesis 5	Test if the higher the rank, the less the variability of faculty research productivity	Rank	Standard deviation Bartlett-box test
Hypothesis 6	Observe if faculty who stay in the rank longer than average publish less than faculty who stay average time or less	Years since rank	ANOVA SNK post hoc test Graph observations

We conducted three chi square tests within each rank to determine the relationship between years since promotion and discipline. We found no association between years since rank and discipline (for assistant professors, $X^2 = 706.9, p = 0.44$; for associate professors, $X^2 = 784.3$, $p = 0.08$; for full professors, $X^2 = 857.5, p = 0.73$). However, 90 percent of the cells had *N*s smaller than 5. Consequently, the test results may possess a bias. If we neglect these test results and assume that years since rank has a significant relationship with discipline, it produces another problem. The small cell sizes violate the X^2 test for significance. With this limitation in mind, we selected the entire sample for testing hypotheses 1, 2, 3, and 6.

Results

Table 2 reports the means, standard deviations, Bartlett-Box F test for homogeneity, ANOVA, and SNK post hoc test results of productivity for the entire sample and discipline subsamples. For the entire sample, full professors publish significantly more research than do assistant professors and associate professors. However, no publication difference exists between assistant professors and associate professors. This result fails to fully support hypothesis 4 that states that the higher the rank,

TABLE 2

Means, Standard Deviations, ANOVA, and SNK Results of the Productivity for Different Disciplines

				Test for Homogeneity of Variance		ANOVA		
Disciplines	*n*	Mean	*SD*	Bartlett-Box *F*	*P*	*F*	*P*	SNK
Entire Sample								
asst	503	3.27	3.59	188.47	0.000***	21.95	0.000***	full > asst
asso	836	3.22	3.90					full > asso
full	1247	4.62	6.54					
Discipline								
Physical science								
asst	26	4.46	3.14	11.27	0.000***	2.06	0.13	
asso	54	4.35	4.37					
full	134	6.89	10.54					
Engineering								
asst	46	3.98	3.02	12.87	0.000***	2.55	0.08	
asso	52	4.54	5.27					
full	93	5.99	6.27					
Computer science								
asst	24	4.04	3.24	2.75	0.064	0.43	0.65	
asso	20	3.35	4.66					
full	25	3.12	2.88					
Biology								
asst	14	3.43	2.82	21.64	0.000***	1.84	0.16	
asso	34	3.74	3.32					
full	91	6.09	8.50					
Health profession								
asst	27	1.93	1.86	8.60	0.000***	3.62	0.03*	full > asst
asso	37	3.76	4.25					asso > asst
full	23	4.35	3.24					
Math/statistics								
asst	30	2.03	1.85	21.81	0.000***	4.40	0.01*	full > asso
asso	43	2.07	2.43					
full	56	4.04	5.10					
Social science								
asst	37	3.59	2.77	15.56	0.000***	0.76	0.47	
asso	79	3.57	5.50					
full	107	4.27	3.41					
Psychology								
asst	17	3.65	2.87	10.11	0.000***	0.49	0.62	
asso	36	3.58	3.37					
full	59	4.53	6.07					
Education								
asst	30	5.00	4.78	9.11	0.000***	1.80	0.17	
asso	70	3.25	2.96					
full	115	3.96	4.76					
Economics								
asst	18	3.06	2.21	9.12	0.000***	1.26	0.29	
asso	20	2.65	2.52					
full	22	4.41	5.38					
Business								
asst	57	2.23	2.51	8.11	0.000***	4.22	0.01*	full > asst
asso	52	3.67	4.39					asso > asst
full	85	3.87	3.33					
Humanities								
asst	52	4.12	6.87	43.89	0.000***	5.16	0.006**	asst > asso
asso	107	2.59	2.38					
full	152	4.14	3.65					

TABLE 2 (*Continued*)

				Test for Homogeneity of Variance		ANOVA		
Disciplines	*n*	Mean	*SD*	Bartlett-Box *F*	*P*	*F*	*P*	SNK
Language								
asst	25	2.20	1.73	33.60	0.000***	3.54	0.03	
asso	29	2.10	1.29					
full	43	4.21	5.42					

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

the higher the productivity.[4] Furthermore, contrary to hypothesis 5, the standard deviation for each rank shows a tendency toward a greater variation of faculty research productivity as faculty advance in rank. The Bartlett-Box F test indicates that the variance of the full professor group is significantly greater than that of the other two ranks. This result indicates that some full professors remain productive after they reached the highest career ladder while other full professors do not.

Productivity patterns vary by discipline subsamples. Statistically, hypothesis 4 is rejected in ten out of thirteen disciplines. These ten disciplines (physical science, engineering, computer science, biology, social science, psychology, education, economics, and language) either show no productivity difference among faculty with different ranks or indicate that assistant professors publish more than associate professors (humanities). In mathematics/statistics and business the evidence partly supports hypothesis 4, namely, that full professors are the most productive. The only discipline that entirely conforms with hypothesis 4 is the health profession. It presents a clear pattern that the higher the rank, the higher the productivity.

Hypothesis 5 predicts that variation of productivity will decrease as rank advances. No such pattern exists in any of the thirteen disciplines. According to the Bartlett-Box F test, twelve out of thirteen disciplines have at least one rank group variance that significantly differs from the other rank groups. More specifically, full professors significantly show the most variation in seven disciplines (physical science, engineering, biology, mathematics/statistics, psychology, economics, and language). Also, in nine out of thirteen disciplines (physical science, engineering, biology, psychology, economics, health profession, social science, and business), assistant professors have the least variation in productivity. We therefore reject hypothesis 5.

In order to test hypothesis 1, 2, 3, and 6, we regrouped faculty in different rank levels based on years since promotion.[5] As can be seen in table 3, assistant professors' productivity in the second year is signifi-

TABLE 3
The Means, ANOVA, and SNK Results of the Productivity of the Assistant Professor Group

Year Group	*n*	Mean	*F*	*P*	SNK
Y1	41	2.68	1.89	0.006**	Y6 > Y2
Y2	78	2.42			Y4 > Y2
Y3	68	4.24			Y3 > Y2
Y4	67	4.40			
Y5	52	3.48			
Y6	57	4.47			
Y7	29	3.97			
Y8	20	3.25			
Y9	12	2.42			
Y10	9	1.89			
Y11	5	0.40			
Y12	3	0.33			
Y13	3	1.00			
Y14	1	1.00			
Y15	2	0.00			
Y16	2	0.00			
Y17	1	0.00			
Y18	3	0.00			
Y19	2	3.00			
Y20	3	0.67			
Y21	2	1.00			
Y22	2	1.00			
Y23	1	0.00			
Y24	2	0.00			
Y25	2	0.00			
Y37	1	0.00			
Y42	1	0.00			

**$p < 0.01$.

cantly lower than that of the third, fourth, and sixth year. This result supports hypothesis 1, which predicts that low productivity occurs in the early years before the next promotion.

Figure 1 displays how productivity varies by years in rank. Beginning in the second year, publications gradually rise, followed by a decline in the fifth year, and then by a rise in the sixth year. Because each rise and fall does not reach statistical significance, the hypothesis that productivity gradually rises as faculty move toward the sixth year of promotion distribution lacks support.

Faculty who remain assistant professors longer than the average six years have fewer publications than their colleagues with the same rank. Due to the small cell size in the older year groups, however, hypothesis 6 is difficult to test. Moreover, the data indicate that although the AAUP asks institutions to set the probation years no longer than a

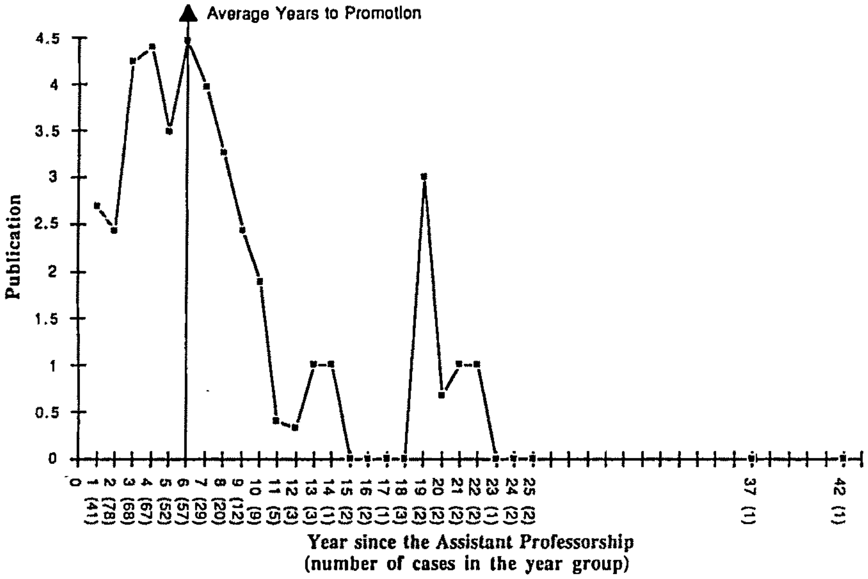

FIG. 1. Productivity Curve of the Assistant Professor Group

maximum of seven years, around 15 percent of faculty in the assistant professor sample remain as assistant professors.[6]

Table 4 shows that associate professors' productivity varies significantly by years since rank. The SNK post hoc tests support hypothesis 6, which states that associate professors who stay at a rank for six years or less have significantly more publications than associate professors who stay at a rank more than seven years.

Figure 2 shows the productivity curve for associate professors. A productivity decline occurs after promotion from the assistant to the associate professorship. Productivity in the second through fifth year gradually increases as the time of promotion approaches. After the sixth year's peak productivity, the curve declines as time passes. The curve changes of some, but not all, year groups reach statistical significance. Overall, the curve changes of associate professors support the hypotheses 1, 2, and 3. These data substantiate the proposition that faculty rank system serves as a reinforcement schedule.

Table 5 reports the means and ANOVA results for the full professor group. Although the association of faculty research productivity with years since promotion is less than the 0.10 significance level, it fails to reach the 0.05 significance level. Consequently, the year groups do not significantly differ from each other by the SNK post hoc test.

Figure 3 plots the means of productivity for each year group of full professors. After promotion to the full professorship, a post-reinforce-

TABLE 4

The Means, ANOVA and SNK Results of the Productivity of the Associate Professor Group

Year Group	*n*	Mean	*F*	*p*	SNK
Y1	65	5.28	3.66	0.000***	Y1 > Y7
Y2	71	3.62			Y1 > Y8
Y3	73	4.18			Y1 > Y9
Y4	68	4.19			Y1 > Y10
Y5	66	4.29			Y1 > Y12
Y6	52	5.23			Y1 > Y13
Y7	47	3.06			Y1 > Y15
Y8	48	2.29			Y1 > Y18
Y9	36	2.33			Y3 > Y10
Y10	52	2.38			Y3 > Y15
Y11	22	2.36			Y4 > Y15
Y12	28	2.04			Y5 > Y15
Y13	30	1.67			Y6 > Y8
Y14	20	2.10			Y6 > Y9
Y15	24	0.96			Y6 > Y10
Y16	12	2.00			Y6 > Y12
Y17	12	1.25			Y6 > Y13
Y18	14	1.29			Y6 > Y15
Y19	8	1.13			
Y20	8	0.38			
Y21	5	1.60			
Y22	3	0.67			
Y23	2	0.50			
Y24	1	0.00			

***$p < 0.001$.

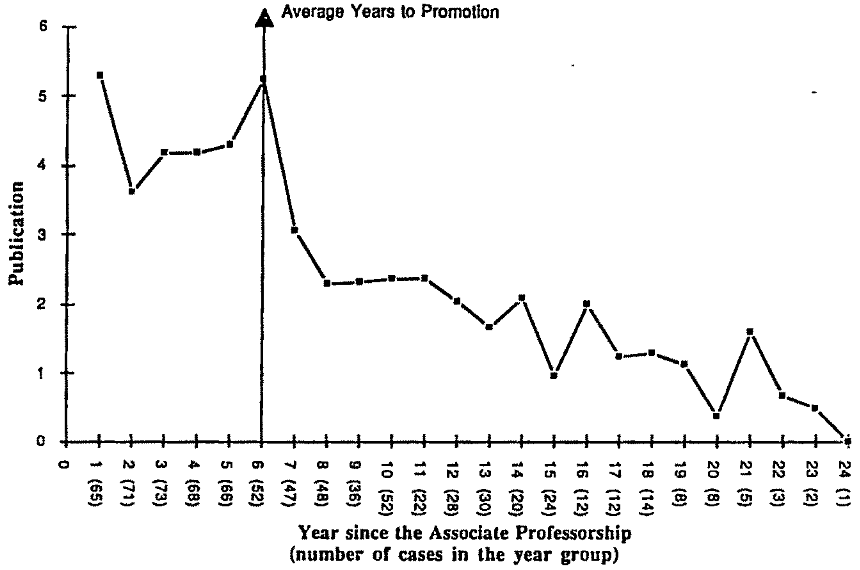

FIG. 2. Productivity Curve of the Associate Professor Group

TABLE 5
The Means, ANOVA, and SNK Results of the Productivity of the Full Professor Group

Year Group	*n*	Mean	*F*	*p*	SNK
Y1	53	5.96	1.34	0.09	None
Y2	51	4.75			
Y3	63	4.84			
Y4	57	5.63			
Y5	55	4.67			
Y6	57	5.35			
Y7	44	4.34			
Y8	55	4.67			
Y9	50	5.96			
Y10	90	4.04			
Y11	31	5.48			
Y12	64	5.31			
Y13	48	7.67			
Y14	47	4.26			
Y15	65	4.14			
Y16	43	3.90			
Y17	33	3.42			
Y18	35	3.31			
Y19	31	2.68			
Y20	42	3.45			
Y21	21	2.86			
Y22	22	5.73			
Y23	20	6.60			
Y24	20	2.10			
Y25	16	4.88			
Y26	5	2.60			
Y27	6	10.17			
Y28	3	9.00			
Y29	3	2.67			
Y30	6	2.17			
Y31	3	1.67			
Y32	2	2.50			
Y33	3	11.67			
Y38	1	1.00			
Y40	1	4.00			

ment takes place in the second year, followed by several productivity waves. Beginning with the thirteenth year, a decline of productivity occurs until the second decade after full professorship. Then the productivity of some faculty with more than twenty years as full professors are even higher than faculty who have just become full professors. We discuss this point in more detail later.

Figure 4 combines the three rank productivity curves for a comparison. The productivity curve of assistant and associate professors are more alike than that of full professors. Among the three groups, full professors are the most productive. However, the productivity curve for

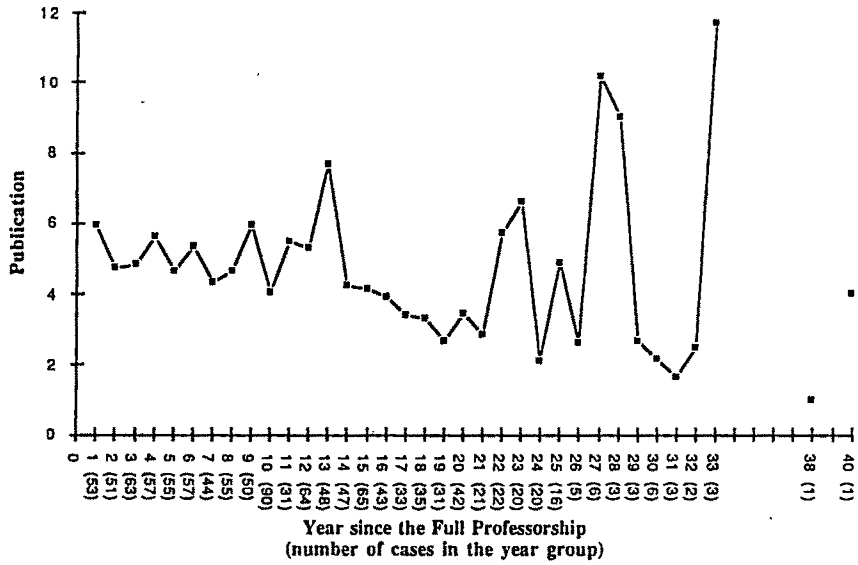

FIG. 3. Productivity Curve of the Full Professor Group

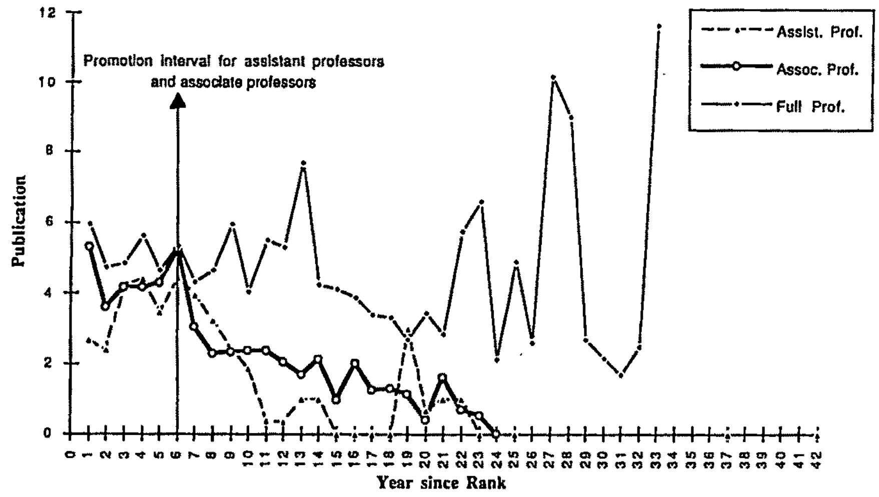

FIG. 4. The Comparison of Productivity Curves of Different Rank Groups

that group is also the most varied. With regard to associate professors, they are more productive than assistant professors in some years while in other years they are not. As years since the current rank exceeds ten, hypothesis 4 — the higher the rank, the higher the productivity — receives support from the graphical presentation.

Summary

Behavioral reinforcement theory suggests promotion has a motivating effect on faculty research performance. The selection function, on the other hand, views promotion as the result of high productivity. The reinforcement schedule hypotheses emphasize the predicting function of distributing promotion (a reward) on the changes of productivity. The selection function implies productivity differences between promoted faculty and nonpromoted faculty.

The data do not fully support either the reinforcement schedule hypothesis or the selection hypothesis. In spite of receiving some support from the graphic displays, the reinforcement schedule hypotheses do not pass all significance testings. Among the three rank groups, the productivity curve of the associate professorship best fits the behavioral reinforcement theory. A post-reinforcement pause occurs after promotion to the associate professorship. The low productivity appears in the early years of promotion. Then it gradually rises as the time of promotion to full professor approaches.

The data do not fully support the selection function. Although full professors publish more research than assistant professors and associate professors do, associate professors do not produce more than assistant professors. Also, contrary to what the selection function predicts, the rank group with the smallest variance in productivity is the assistant professor, not the full professor group.

Discussion

Why do the assistant professors not publish significantly less than the associate professors do? Why does the assistant professor group show the least variation in productivity?

One may argue that the importance of the promotion rewards varies among individuals. To some faculty members, getting tenure may be much more important than climbing the career ladder later after they ensure their job security. Hence, they would invest efforts accordingly to each level of promotion rewards. Still, given the cross-sectional data, whether the variations of productivity between assistant and associate professors is due to reward differences or because of cohort differences needs further investigation.

The only support for the selection function occurs from employing years since rank, not rank per se, as the independent variable. Assistant and associate professors who stay in the rank longer than the average six years are less productive than other colleagues in the same ranks.

Although the result suggests that the faculty rank system operates as a selection system — the fewer publications one produces, the longer one stays in the rank — the result can be also explained from the perspective of behavioral reinforcement theory. On the basis of this theory, "years since promotion" can be viewed as a proxy measure of "the desire for promotion." One can argue that the longer a faculty member stays in a rank, the less desire he or she has for promotion. Consequently, the faculty member would not follow the promotion norm to publish. That is, a faculty member's lower desire for promotion leads her or him to publish less.

The phenomenon that full professors are the most productive faculty but not the most homogeneous merits more discussion. Why are some full professors still productive after a promotion reward no longer exists? Different theories provide different explanations. Cognitive evaluation theory [17] suggests the importance of intrinsic motivation on productivity. The accumulative advantage theorists emphasize the critical role of resources acquisition [2, 6]. Even from the behavioral reinforcement theory's perspective, one can argue that other external rewards — for example, salary increase and peer recognition, pure enjoyment, a continuing dedication to search for truths and to share them via the accepted outlet of journals — continue to operate during the full professorship for some, even if not for all. Because different theories are all possible candidates for explaining the phenomenon that full professors continue publishing even when the promotion reward is no longer operating, Finkelstein's [19] claim that intrinsic motivation plays a preeminent role on productivity has not been fully substantiated.

Also, because full professors are a heterogeneous group, despite what the selection function predicts regarding their similarities of research capability and orientations, we need to look further into who among the full professor group remains productive and who does not as well as to the factors that contribute to these disparities. Because rewards may have different meanings and motivating effects on faculty members, such an inquiry would more fully explain faculty attitudes and behaviors.

Research Limitations and Suggestions

This study improves correlate measures by using years since rank as the appropriate variable instead of rank per se. It explores the relationship between a system of faculty ranks and research productivity from the perspectives of behavioral reinforcement theory and the selection function. Still, limitations remain.

First, the study has a cross-sectional design. Although it provides a description of the current phenomenon, its ability to make a causal claim — namely, that rank has a motivating effect on productivity — is still limited. We recommend utilization of longitudinal data. Second, using the sixth year as the average promotion interval is somewhat arbitrary. One may argue that faculty members hold the power to influence the interval length of promotion for themselves, particularly at the associate professor level. A higher producer may make the interval length shorter. Also, institutional policies as well as market conditions can influence the promotion interval. Future studies need to take these factors into account. Last, this research only employs the behavioral reinforcement theory and selection perspectives to analyze the relationship between rank and productivity. Other motivation theories, such as cognitive evaluation theory and expectancy theory, have different points of view on the relationship between rewards, motivation, and performance. Testing these theories requires a sound measure of motivation. As we mentioned in the literature review, the current faculty surveys, like the 1989 Carnegie data we employed, do not have a good motivation measure. Therefore, we recommend efforts on refining motivation measures and testing of these theories.

Despite these limitations and the less than full support for the tested theory, the analyses provide insight into the relationships between promotion and productivity. Right now the most warranted conclusion is that motivation toward research productivity is neither purely intrinsic nor purely extrinsic. Rather, both appear to operate depending upon the circumstances of the individuals, their values, and the social situation of the moment.

Notes

[1] We restricted our analyses to Comprehensive-I through Research-I institutions. We combined the five types so as to have sufficient *N*'s to run the needed analyses while simultaneously acknowledging how important it is to control for institutional type differences.

[2] There is some empirical evidence that counters this hypothesis for assistant professor today. Ever since the market has favored the institutions — since the late 1970s in many disciplines — assistant professors no longer are hired as ABDs or even on the grounds of promise based on the quality ranking of their graduate department. Persons having already published and having an active research agenda are the ones getting hired. They land running, not starting from scratch. See note 3 accompanying Hypothesis 4 below.

[3] Rank had correlated positively with article publications from the 1968 through 1984 national surveys. However, in 1988 it did not. The 1988 correlation is even negative, but slight. What has happened is that the new cohorts of assistant professors consist of outstanding researchers who are publishing at higher rates than the two ranks above them. See Bentley and Blackburn [7]. Therefore, this hypothesis needs to be tested.

[4] See note 3 above.

[5] Because the Carnegie data are a cross-sectional rather than a longitudinal design, we remind readers that in the following analysis the subjects of each year group are not the same subjects as in prior and successive year groups.

[6] The 15 percent figure indicates that an appreciable number of institutions do not subscribe to AAUP's policy. Other factors may account for the unexpected high percentage. For example, some institutions have extended their trial period to seven years so as to be more certain that those they tenure — a life-time, expensive commitment — have genuinely proved themselves so that the institution's confidence that they will continue to be productive increases. Many colleges and universities have also stopped the tenure clock for women having children, thereby adding at least one additional year for them. And then, those who fail the tenure review are given another year of appointment before their contract is not renewed. When an individual encounters all of these processes, she could be an assistant professor for ten years and be in the Carnegie sample.

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Performance Funding Comes of Age in Tennessee

> The Performance Funding Program is designed to stimulate instructional improvement and student learning as institutions carry out their respective missions. Performance Funding is an incentive for meritorious institutional performance and provides the citizens of Tennessee, the Executive Branch of state government, the legislature, education officials, and faculty with a means of assessing the progress of publicly funded higher education. By encouraging instructional excellence, the Performance Funding Program contributes to continuing public support of higher education and complements academic planning, program improvement, and student learning.
>
> Tennessee Higher Education Commission
> 9 February 1990

In 1979 Tennessee became the first state to base a portion of state funding for higher education not upon student head count, but on institutional performance, particularly in enhancing student learning outcomes. In that year the Tennessee Higher Education Commission (THEC) instituted a policy that gave public two- and four-year institutions an opportunity to earn a budget supplement of up to two percent of the instructional component of its education and general budget for carrying out the following activities: (1) obtaining accreditation for accreditable academic programs; (2) testing graduating students in their major fields and in general education using standardized externally developed examinations, and — for additional credit — demonstrating that graduates score at or above national averages on

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these tests; (3) surveying enrolled students, recent graduates, and/or community members/employers to assess their satisfaction with the institution's academic programs and student services; and (4) conducting peer reviews of its academic programs.

The criteria on which performance funding is based in Tennessee have been revised four times since 1979 — in 1980, 1982, 1986, and 1991 (see Table 1). As the THEC has developed more confidence in the value of its voluntary program of performance funding in stimulating improvement in institutional quality, the budget supplement associated with the policy has increased from 2, to 5, to 5.45 percent of each institution's annual budget for instruction.

Since the first financial incentives for evidence of student learning and program quality were proposed by the Tennessee Higher Education Commission, three-quarters of the other states and all the regional accrediting associations have issued calls for institutions to demonstrate their accountability for the use of public funds. Texas, Arkansas, Kentucky, South Carolina, and New Mexico are among the states that have begun to associate funding with institutional reporting of such quantitative data as retention/graduation rates, placement of graduates, and — for community colleges — rates of transfer to four-year institutions [6]. However, to date no other state or agency has been as prescriptive as the THEC in suggesting the use of common standardized examinations across programs and institutions and in basing specific amounts of funding on levels of test scores and numerical ratings of satisfaction [19].

Despite the fact that no other state has yet adopted a policy quite like it, performance funding has been confirmed in four iterations of policy guidelines, and Tennessee institutions are midway in a third five-year plan for implementing this unique accountability initiative. What has contributed to the longevity of this program? What are the strengths and weaknesses of the third five-year plan compared to previous versions of performance funding policy? Can the Tennessee experiment suggest which specific performance indicators seem to hold most promise for stimulating improvements on college and university campuses?

In order to provide some answers to these questions, during the second year of the 1992–97 cycle of performance funding policy in Tennessee, the authors undertook a study of the ways in which this new edition of the policy is working on two- and four-year campuses across the state. We gathered data by surveying the individuals most knowledgeable about the implementation of the policy: Tennessee's twenty-three campus performance funding coordinators.

TABLE 1

Evolution of Tennessee's Performance-Funding Standards 1979-1997 Standards and Associated Weights (% of 100 points)

1979-1980	%	1981-1982	%	1983-1987	%	1988-1992	%	1993-1997	%
1. Program accreditation	(20)	1. Program accreditation	(20)	1. Program accreditation	(25)	1. Accreditation	(20)	1. Accreditation	(10)
								2. Major field tests	(10)
2. Graduate's performance on major field test	(20)	2. Program performance outcomes	(20)	2. Program field evaluation — via testing or peer review	(30)	2. Major field assessment	(30)	3. Measurement of general education outcomes	(10)
								4. Alumni and enrolled student surveys	(10)
3. Graduates' performance on general education outcome measure	(20)	3. General education outcomes	(20)	3. Institutionwide education outcomes via test scores and value added for 4-year and placement of graduates of 2-year institutions	(25)	3. Undergraduate general education outcomes	(20)	5. Improvement actions taken to remedy identified weaknesses	(10)
								6. Peer review of non-accreditable undergraduate programs	(10)
4. Evaluation of programs and services via surveys for students, graduates, employers	(20)	4. Programs/services satisfaction	(20)	4. Instructional improvement based on surveys	(10)	4. Satisfaction surveys	(15)	7. Master's program reviews (universities) or placement (2-year institutions)	(10)
								8. Enrollment goals for campus-specific groups	(10)
5. Peer evaluation of academic programs	(20)	5. Evaluation planning for renewal and improvement	(20)	5. Planning for instructional program improvement	(10)	5. Corrective measures (planning for instructional improvement)	(15)	9. Persistence to graduation for minority and all students	(10)
								10. Mission-specific objectives	(10)
	100		100		100		100		100

Evolution of Tennessee's Performance Funding Guidelines

Statewide studies that ultimately produced the outlines of performance funding policy in Tennessee were undertaken in 1975 with funding from the Kellogg and Ford Foundations and the Fund for the Improvement of Postsecondary Education. The purpose of this work, which involved twelve of the twenty-one public institutions in Tennessee at that time in carrying out locally designed pilot projects, was to determine if a portion of the state allocation for higher education could be based on performance criteria rather than the traditional enrollment-driven funding formula [14]. Grady Bogue and Wayne Brown, chief THEC architects of the 1979 performance funding criteria for institutions, tried to combine accountability and improvement purposes in a single process of assessment when they characterized the new policy as a means "to improve the return on [Tennessee's] higher education investment" [5, p. 123].

The first performance-funding guidelines did not require institutions to gather a great deal of new information. A few surveys of constituent satisfaction had to be conducted, but only the handful of (mostly professional) disciplines with access to an externally normed comprehensive examination had to report scores on these measures, and the choice of a test of generic skills (general education outcomes) was up to each institution.

By 1982 the THEC was prepared to launch a five-year plan for performance funding. The guidelines for the period from 1983 to 1987 contained implications for institutional effort that were far more pervasive than were the 1979 criteria. Evaluation, whether by means of a national or locally developed test for graduates or by external peer review, was required in virtually every program field offering an undergraduate major. Only the ACT COMP examination could be used to test achievement in general education, and a value-added statistic — an estimate of student score gain based on the difference between an imputed freshman COMP score derived from the entering ACT Assessment test score and the actual senior COMP score — was added to the list of scoring mechanisms. A description of "specific substantial, instructional improvement actions" [14, p. 149] taken on the basis of findings was added to the criteria for scoring the standard based on surveys. The scoring criteria for all five "instructional evaluation variables" [14, p. 139] were strengthened and made much more precise; the length of the document describing the performance-funding guidelines doubled in comparison with the 1979-82 version.

The principal effect of the revisions incorporated in the guidelines for the second five-year plan for performance funding — 1988-92 — was to fine-tune the scoring methods. Institutions had begun to raise substantive criticisms about the use of test scores as criteria for funding higher education. At the same time, the campuses contended that surveys and peer review were more influential than test scores in directing improvements. Thus peer review of graduate programs, with a quantitative component derived from a rating form completed by external reviewers, was introduced in the list of criteria, and more weight was given in scoring to the use of surveys. The scoring weights for surveying and documented evidence of improvement actions undertaken on campus were increased by decreasing the weights for the standards on accreditation (no longer considered an indicator of quality above a minimal level) and general education assessment. Finally, scoring on several standards was broadened to permit credit to be earned by improving institutional performance over time as well as by exceeding an established norm, which heretofore had been the only way to earn rewards.

The standards governing the third five-year plan for performance funding — 1993-97 — represented a substantial movement in the direction of assessment for internal improvement as opposed to external reporting (see the purpose statement with which this article begins). The number of standards to which institutions must respond was doubled, from five to ten, but the increase enabled institutions to set their own goals in a number of areas. Retention and graduation goals; enrollment goals for minorities, highly qualified students, or other special groups; and mission-specific objectives were all new performance-funding categories, and all encouraged institutions to set their own goals and measure progress in their own ways. In addition, peer review, a process with considerable intellectual appeal for faculty, was extended as a means of evaluation to unaccreditable undergraduate programs. And scoring mechanisms were modified and improved to ensure that awards would be based on statistically significant improvements as opposed to random fluctuations.

Even with the increase in institutional autonomy in choosing assessment targets and methods that is conferred by the 1993-97 performance funding criteria, faculty and administrators at Tennessee's public colleges and universities still debate the fundamental issues confronted by the program's architects in the late 1970s. Like their colleagues at institutions across the country, they ask, "Is it possible to measure the *quality* of higher education with sufficient precision, that is, reliability and validity, to base funding decisions on the results of applying the measures?" And second, "Can assessment undertaken to meet external accountability demands also be sufficiently adaptable to local purposes that faculty can use its results to make improvements in campus programs and services?"

Survey of Tennessee's Public Institutions

Data for this study were gathered using a survey instrument that was sent by mail to the person responsible for compiling the annual performance-funding report at each of the state's twenty-three public colleges and universities. At the time of the survey, twelve of these individuals were administrators with faculty rank, eleven were full-time administrators without faculty affiliation. While the size of this population is small, we made the assumption that these campus coordinators would know most about the reactions of faculty and staff across disciplines to performance funding and about the strengths and limitations of the policy's data-gathering strategies. Completed questionnaires were received from all twenty-three institutions, including four technical institutes, ten community colleges, six comprehensive universities in the Tennessee Board of Regents system, and three campuses of the University of Tennessee.

The Questions

In the survey instrument, which was field-tested on four campuses, we chose to confront directly the questions about purpose and measurement quality that trouble educators across the country as they address the press to assess. For each of the ten performance-funding standards, the campus coordinators were asked to engage in an assessment process they know very well: They were instructed to give a grade — A, B, C, D, or F — to the standard "as a *measure* of the *quality* of higher education." Is it an outstanding measure? (Grade of A) Does it work reasonably well? (Grade of B or C) Or is it a poor measure? (Grade of D or F).

The second question related to each standard concerned the value of the standard in *promoting improvement:* "Has this standard led to improvement in student learning on your campus?" The response options were Yes; Not yet, but has potential; No, has no potential; and Too soon to tell. In tallying the responses, the second and fourth options —Not yet and Too soon — were combined.

Campus respondents were asked two additional questions about each of the ten standards: "What are the *most helpful* features of this standard and its measures as applied on your campus? Please describe improvements, if any, fostered by the standard"; and "How would you change this standard and its measures to make them more helpful?"

Overall Ratings of the Standards

Table 2 displays the ranking of the ten current performance standards in terms of the ratings assigned to them as measures of quality by those most directly associated with implementing the standards at Tennessee's public campuses. Not surprisingly, peer review by external specialists is the method of assessing quality most favored by campuses. Peer review of unaccreditable undergraduate programs and of master's degree programs and external accreditation — also a peer review process — head the list. (As the table indicates, placement of graduates, which is a type of external review of an institution's output in terms of student preparedness, is the measure of quality used by two-year colleges in place of peer review of master's programs.) Improvement actions and surveys round out the top five measures of quality as determined by campus assessment coordinators. The five preferred measures were accorded B grades; the other five on the list received Cs.

Besides its rating at the top of the list of ten measures, the strength of peer review as a preferred method of assessing quality is further emphasized by the fact that peer review of undergraduate programs is the only one of four new performance-funding standards added to the

TABLE 2
Ratings of 1993-97 Performance-Funding Standards

	Rating as a Measure of Quality				Perceived Effectiveness in Promoting Improvement		
	2 Year[a]	TBR Comp[a]	UT[a]	Average[b]	Yes	No	Perhaps
Peer review of UG programs	3.31	3.67	3.33	3.41 B+	52%	5%	43%
Master's reviews or placement	3.33	3.60	3.33	3.40 B+	79%	11%	10%
Accreditation	3.31	2.67	3.00	3.09 B	85%	5%	10%
Improvement actions	3.08	2.67	2.67	2.90 B	71%	10%	19%
Student and Alumni surveys	3.00	2.17	2.17	2.78 B−	67%	4%	29%
Major field tests	2.50	2.33	2.33	2.43 C+	55%	18%	27%
Mission specific goals	2.42	2.20	2.50	2.37 C+	41%	14%	46%
General education tests	2.29	2.0	1.33	2.08 C	26%	26%	47%
Retention and graduation goals	2.00	2.00	2.00	2.00 C	0%	19%	81%
Minority/other enrollment goals	1.85	0.83	2.00	1.59 D+	14%	33%	53%

[a] 2-year = Community colleges and technical institutes. TBR Comp = Comprehensive institutions in the TBR system. UT — University of Tennessee campuses.

[b] Average is not weighted by sector. Every institution counts equally.

1993–97 plan that received a grade of B. The others — mission-specific goals, retention and graduation goals, and minority/other enrollment goals — were given C grades and placed 7, 9, and 10 in the rankings. Testing in major fields and in general education, two of the original 1979 performance-funding standards, were ranked 6 and 8, respectively.

Another story is told in the three columns of Table 2 that record the responses to the question, "Has this standard led to improvement in student learning on your campus?" Here accreditation of accreditable programs tops the list as a stimulus for improvement: 85 percent of the respondents believed this standard, another of the original 1979 performance-funding criteria, had improved student learning on their campuses.

At least two-thirds of the survey respondents reported that master's reviews/placement, improvement actions, and surveys — also criteria with longevity as performance-funding standards — had actually produced improvements in student learning. More than half were willing to say this about major field testing (55 percent) and peer review of undergraduate programs (52 percent). The latter rating is all the more noteworthy because at the time of the survey the standard had had little more than a year in which to exert its influence, whereas the other four had been in effect for at least a decade.

The low "Yes" percentages for the three new standards incorporating goal-setting are not surprising, because most goals specify targets for improvement that are several years in the future. The fact that after fifteen years only 26 percent of the campuses ascribed any positive influence on student learning to the massive efforts made to test most graduates using a standardized test of general education (until 1993 the ACT College Outcomes Measures Project [COMP] examination was required) is a more significant finding. Another 26 percent of the respondents believed general education testing had no potential for improving student learning.

The column labeled "Perhaps" combines the responses in the "Too soon to tell" and "Not yet, but has potential" categories for the item on improvements attributable to performance-funding standards. Here the three new standards that permit institutions to set their own goals stand out: they are ranked 1, 2, and 4 of the top five in terms of their potential. General education testing ranks third in this list, perhaps because for the first time an alternative to the ACT COMP examination — the College Basic Academic Subjects Exam (BASE) — was permitted, but the new instrument had not been in use long enough to suggest changes. Peer review of undergraduate programs rounds out the list of five standards with the most hope of producing improvements in the future, according to the campus assessment coordinators.

Respondents' Comments On the Standards

In many ways more revealing than the item statistics reported in Table 2 are the written comments on the standards that were provided by the survey respondents. In the sections that follow, the scoring criteria for each performance-funding standard are explained, and the differences among institutional sectors that are evident in both ratings and comments are discussed. Not surprisingly, many of these differences relate to scoring methods.

Peer review of unaccreditable undergraduate programs. Survey respondents seemed to appreciate peer review. They said that the process of self-study prior to a visit by at least one out-of-state consultant brings students and faculty together to talk about appropriateness of program goals, use of resources, structure of the curriculum, quality of instruction, and helpfulness of student services. These conversations themselves often suggest improvements that are implemented even before the reviewer arrives.

The Tennessee Board of Regents' (TBR) comprehensive four-year institutions exhibited the most favorable attitudes toward this standard. Respondents' comments indicated that such reviews were relatively new on these campuses. Reviews had been in place at the University of Tennessee for almost two decades, and two-year institutions often work closely with employer and community representatives to establish and evaluate their programs. While initially there was some apprehension about the reviews on the comprehensive campuses, the results were surprisingly affirming and positive.

Respondents expressed only one concern about this standard — that simple pass/fail options on the standard rating form used by the external reviewer seemed too lenient. Because the THEC staff agreed to apply more precise scoring mechanisms for the following year, even this reservation may disappear with time.

Master's program reviews or placement. This standard specifies differential requirements for two- and four-year institutions. Four-year institutions must conduct peer reviews of their master's degree programs, asking at least one out-of-state consultant to visit the program and complete a rating form containing a set of objective indicators of program quality. Performance funding credit is based on the cumulative percentage of qualitative indicators judged to be met by the institutions's programs. Two-year colleges must report on placement of graduates in (1) jobs related to the field of preparation, (2) military service, or (3) further education. Scoring is based on the percentage of an institution's programs reporting placement rates of 75 percent or better.

The rating form for use in the external reviews of master's degree programs is based on criteria developed by consensus among the members of the Tennessee Conference of Graduate School Deans early in the 1980s [17]. Thus there is a prevailing perception that the standards against which programs are being judged are appropriate and fair. Respondents report that applying these standards has produced substantive change in some programs. For instance, admission standards have been strengthened, curricula have been modified, and comprehensive examinations near the end of the degree program have been instituted where none existed previously. On some campuses, master's degree programs have been eliminated or consolidated with other programs in response to reviewers' recommendations.

Placement is widely considered to be an appropriate indicator of the quality of two-year programs. The performance-funding standard encourages institutions to be more diligent in their efforts to track their graduates, and respondents observe that reviewing the annual statistics has been a force for keeping programs market-conscious and curricula up to date. On the other hand, criteria for scoring this standard give equal weight to all programs, regardless of size, and some coordinators believe programs should be given differential weights based on numbers of graduates. Moreover, a universal concern about basing performance funding on placement rates is that these indicators can be influenced dramatically by economic conditions and industry changes, factors that educational institutions cannot control.

Accreditation of accreditable programs. This standard has been in effect since the beginning of performance funding and is considered by some to be the most productive of all the standards in stimulating positive change in programs. Scoring is based simply on the percentage of accreditable programs that are accredited. Although there is general support for accreditation as a standard, survey respondents expressed concerns about it. First, they asserted that there must always be — as there is now — provision for exemptions from the standard. Some programs — the master's degree in environmental engineering at the University of Tennessee, Knoxville (UTK), for example — have been designed to meet local needs and do so to the satisfaction of most observers. But because of some technicality — like the requirement that all who enter the program have degrees in engineering, which is not deemed necessary for the environmental engineering credential at UTK — they do not meet accreditation standards.

Respondents also argue that some accreditors still emphasize the resources going into a program — space and equipment, size of library collection, student/faculty ratios — rather than program outcomes. Thus accreditation may certify that some minimal level of quality exists but not recognize truly outstanding accomplishment.

The accreditation standard was rated highest as a measure of quality by respondents representing two-year institutions, where all accreditable programs are accredited, and lowest by the four-year institutions in the TBR system, the sector with the largest number of unaccredited programs. Respondents from universities in the latter category expressed grave concern, based on their experience, about the extent to which the pressure to gain accreditation for certain programs can cause institutions to shift resources inequitably toward accreditable programs. Thus the press to accredit for accountability purposes can have the undesirable effect of diverting an institution from supporting those programs considered most critical to its mission as it curries favor with accreditors.

Improvement actions based on assessment findings. A plan for institutional improvement based in part on assessment findings has been a performance-funding requirement since 1980, when a series of minor modifications was made in the original standards. Campus representatives, especially those from two-year colleges, were generally supportive of this standard, because it permits a campus to chart its own course with respect to improvements and provides opportunities for an institution to establish some goals that are not quantifiable. Assessment coordinators also welcomed the impetus this standard gives for faculty and administrators to make use of assessment information rather than follow the path of least resistance and ignore it once it is collected and reported to the state.

Student and alumni surveys. Campus coordinators reported that faculty and administrators displayed genuine respect for customer feedback obtained from surveys. Because survey responses are quite specific, inferences about what improvement actions to take are often much easier to make than is the case when student test scores are found to be low. Over the years, enrichment in the campus program of cultural activities, improvements in academic advising, and increased attention to career planning and placement activities are some of the more common actions attributed to the use of assessment data collected via surveys.

Concerns about this standard stem from the way it is scored for performance-funding credit. The same survey instrument must be administered by all institutions regardless of mission, then statewide means are calculated for two- and four-year institutions, and scoring for each item is based on whether the mean response for the institution is above or below the state average or its own average on a prior administration. Institutional representatives, especially those at the TBR comprehensive institutions, said they would like more control of the kinds of questions asked of their graduates, and some resented the use of statewide comparisons in scoring. Many would prefer to be judged only by the extent to which their own mean responses show improvement over time.

Major field testing. Campuses are expected to assess student achievement in the major by administering a standardized or locally developed test to seniors in at least 20 percent of the major fields on an annual basis. Comparisons are made to national norms or to previous scores on the same test, using a standardized procedure.

Some respondents saw overall benefits in asking faculty to provide comprehensive assessment for program graduates. Within many departments faculty have been forced by this standard to consider collectively such concepts as program goals (intended comprehensive outcomes for student learning), curricular structure, course content, sequencing of content, and methods of instruction and assessment. Resultant increases in clarity of purpose for curricula and courses in the minds of faculty have helped students understand why they need specific courses and what each course is designed to accomplish.

The results of testing students in their majors have convinced some faculty to make a number of curricular and instructional changes: Some are now requiring courses that previously were electives, a few new courses have been added to some curricula, many more majors now include a capstone course, and assessment methods have been improved and made more comprehensive.

Faculty in two- and four-year institutions are often frustrated by the quality of assessment instruments, however. They may find that standardized tests cover only a fraction of the content they consider important; moreover, the scores returned by testing companies are often too general (pass/fail or a single composite score) to provide specific direction for improvements. Locally developed tests, on the other hand, take a great deal of faculty time, both in the design phase and when they are scored. Local tests may also lack reliability and validity unless sufficient technical work is done to ensure these characteristics. Regardless of the quality of standardized or local measures, the results they yield can be rendered meaningless if students taking them decide that assessment is not sufficiently important to warrant their best efforts.

Mission-specific goals. This standard is designed to provide incentives for institutions' success in accomplishing their own strategic planning goals. At the beginning of the five-year performance-funding cycle, governing boards approved five-year goals with annual benchmarks for each institution. Points are awarded annually on the basis of the percentage of benchmarks attained.

Assessment coordinators applaud the intent behind a performance funding standard that permits an institution to set some goals based on its own mission, then chart progress toward those goals using its own methods. Although this standard was new, respondents already credited it with galvanizing attention on goals and attendant progress in ways not observed previously. Ensuring that state dollars will be channeled into activities upon which the institution has conferred priority status is another strong advantage associated with this standard.

The standard is not without problems, however. Some respondents, particularly those from TBR comprehensive institutions, who gave this standard its lowest rating, felt that the standard provided an opportunity for setting goals institutions could accomplish easily. On the other hand, progress on some goals is difficult to assess, and may only be observable over five to ten years. Thus basing state dollars on annual reports of "progress" on these goals did not appear to some respondents to be a valid methodology.

General education testing. Using the ACT COMP examination or the CBASE with a sample of graduating students, two- and four-year institutions derive a standardized score based on national norms or a prior local score on the same test. Points are awarded by comparing an institution's score with tabled values that take into account the entering abilities of students as measured by the ACT Assessment examination.

Some campus assessment coordinators attribute increased attention to longitudinal studies of students' progress in attaining basic skills to the influence of this performance-funding standard over the past fifteen years. Several writing-across-the-curriculum projects as well as similar efforts in speaking, mathematics, and computing can also be traced to this standard.

However, at a number of institutions, especially the University of Tennessee campuses where the standard's lowest ratings were given, student motivation has proven to be a major drawback to achieving the purposes for which the standard was instituted. Where a standardized test is required of graduating students but scores are not connected with class credit or other meaningful incentives, a small but unknown and therefore potentially significant number of students will comply with the requirement to be tested but will not do their best work on the examination. Thus institutional means are suspect as bases for suggesting directions for change [15].

During the decade when the ACT COMP examination was the only acceptable measure, many faculty found it difficult to interpret the meaning of the COMP subscores and thus their implications for change in curricula or instruction [3]. CBASE, which now may be substituted for the COMP, yields subscores in basic skills that are more familiar to faculty, but the new examinations has not been in use in Tennessee long enough for aggregate scores to suggest clearly the kinds of changes that institutions need to make.

Retention and graduation goals. This new standard bases incentive funding on institutions' success in meeting their own goals for fall-to-fall retention and six-year graduation rates for first-time/full-time freshmen, with special emphasis on the persistence of minority students. In addition, institutions are encouraged to set their own goals for enrolling more academically talented students, more adults, more transfer students from community colleges, and other special groups. Credit was given in the first year simply for formulating a plan to promote retention.

This standard focuses attention on the primary goals of retaining students and promoting their progress toward graduation, and some important new initiatives for achieving these goals have been undertaken. However, survey respondents pointed out that student retention is influenced in part by personal and economic factors that institutions cannot control. Moreover, improvements in retention and graduation rates will take a long time to achieve and indeed may fluctuate from year to year rather than show steady increases. Some faculty fear that there may be pressure to lower classroom grading standards in order to increase retention and completion statistics.

Institutions near state borders argue that they should receive credit for students who graduate in other states as well as in Tennessee (where currently the only tracking is conducted). Some also recommend that students be tracked in private as well as public institutions.

Finally, several coordinators referred to the article by Alexander Astin in the 22 September 1993 *Chronicle of Higher Education* [1] in which he argued for basing expected retention rates on ability levels of entering students. The coordinators contended that the importance of the correlation between ability and retention was not fully recognized when the campus goals for retention were established. Thus the goals may have been set too high on some campuses and too low on others.

Enrollment goals for minorities and other groups. This new standard was designed to give further impetus to goals for increasing the enrollment of African-American students in Tennessee colleges that were established by a court order issued in Tennessee in the 1970s and revisited by the courts more recently [10]. The state's assessment coordinators praised this standard for focusing attention on the need to recruit differentially, that is, to develop different strategies to attract different groups. Indeed a number of new recruiting initiatives have been undertaken. However, the coordinators expressed concern because success in meeting recruiting goals may be unduly influenced by factors like location, over which the institution has little control. Uncertainty about likelihood of success may lead institutions to set goals that are safe rather than realistic or inspiring.

Coordinators at the TBR comprehensive institutions, where ratings were lowest, faulted the enrollment standard, because they thought that enrolling students is a process, not an outcome, and thus should not be considered a performance standard. Others contended that, in fact, it is the process rather than the outcome of recruiting strategies that should be assessed for performance-funding credit, because goal attainment is long term and not reliably measured on an annual basis due to short-term fluctuations in achievement.

All standards combined. In a final section of the questionnaire, campus assessment coordinators were asked to give a grade to the influence in improving *institutional effectiveness* of the entire set of ten performance-funding standards working together. The average for all respondents was a C (2.38 on the 5-point scale), with the University of Tennessee campuses giving the standards the lowest average rating (1.67), TBR comprehensive universities averaging 2.17, and the two-year institutions 2.67. When asked to grade the 1993-97 standards as an improvement over the 1987-92 criteria for performance funding, the average grade was a C minus (1.67 of 5). Here the University of Tennessee campuses conferred the highest rating (2.0), followed by the TBR universities at 1.83 and the two-year institutions at 1.5.

Limitations of the Survey

Although the campus performance-funding coordinators are the most knowledgeable individuals about the way the standards and their scoring criteria work among the faculty and administrators affected by performance funding, the small number of respondents subjected the mean ratings to the possibility of response bias. In fact, a single individual, 4.3 percent of the population, gave the rating of F to all the standards as measures of quality except the two having to do with peer review of undergraduate and graduate programs. This meant that the range on eight of ten standards was from A to F, and that all the ratings for which the F was used were slightly lower than they would have been without it. Eliminating that response would not have changed the rank order of the list of standards as measures of quality, however.

Samples of faculty and of administrators on the twenty-three campuses might have given responses differing in some respects from those we obtained from the campus coordinators. Certainly, greater numbers of respondents could have alleviated some of the concerns about response bias.

If we had asked different or more detailed questions about each standard, the overall impression we obtained from the data might have been somewhat different. For each standard we asked simply for (1) a grade as a measure of the quality of higher education, (2) a judgment about the extent to which the standard had led to improvement on campus, (3) a list of the most helpful features of the standard and its scoring criteria, and (4) suggestions for change to make the standard more helpful. Because the number of items was small, every respondent completed the questionnaire, and all provided written comments on a majority of the open-ended responses. In the foregoing presentation of results we have given more attention and emphasis to the respondents' comments than to the numerical ratings, because the comments provide so much more insight into the strengths and weaknesses the coordinators attribute to the standards.

Discussion

Since Tennessee initiated performance funding in 1979, one-third of the states — most beginning programs in the 1990s — have adopted performance indicators for public higher education [7]. Staff of the State Higher Education Executive Officers stated recently, "The push for accountability is not likely to disappear soon, and will become even more intertwined with how higher education does business" [20, p. 3]. Indeed, the increasing interest in assessing quality in higher education is now a worldwide phenomenon. The International Network for Quality Assurance Agencies in Higher Education, founded at the turn of this decade by the Hong Kong Council on Academic Accreditation, now has members in thirty-six countries [13]. Westerheijden, Brennan, and Maassen [24] report that the European Union considers quality improvement one of the principal aims of its policies for higher education under the Treaty of Maastricht.

After considerable study of alternative systems, Scotland [12], Australia [16], and Sweden [4] have adopted performance-funding strategies resembling Tennessee's program. In Sweden, for example, 55 percent of each institution's funding from the government is dependent on students' performance, "that is, the sum of credit-points they gain in course-examinations as compared to predefined criteria, based on a national average for each area" [4, p. 141]. As additional states in the United States and countries around the world consider indicator systems for funding higher education on the basis of performance, what advice can be gleaned from Tennessee's experience with performance funding?

A Framework for Indicators

Based on a study of the use of performance indicators in ten states conducted for the Education Commission of the States (ECS) [19], Richardson concluded, "States considering the adoption of quality indicators for monitoring a system of higher education would be well-advised to incorporate requirements for planning, institutional improvement, and accountability in their design, since all three must be addressed over time" [18, p. 145]. Ewell, who made the site visit and wrote the Tennessee case study for ECS, provided evidence for Richardson's observation that the THEC's performance-funding policy encompasses all three of the elements of Richardson's framework [8].

According to Richardson, "Tennessee . . . has a significant strategic planning history. Its early use of performance funding was designed to ensure institutional attention to state priorities" [18, p. 133]. These priorities include student access (standard on enrollment goals), competence in general education and in the major (standards on achievement in general education and the major), and job placement (standard on placement for two-year institutions).

According to Bogue and Brown [5], the THEC staff members who took the lead in implementing performance funding in the late 1970s, the policy has from the outset been designed to improve higher education in the state. In 1990 the THEC staff reiterated this goal in a formal statement of purpose: "The Performance Funding Program is designed to stimulate instructional improvement and student learning as institutions carry out their respective missions" [21, p. ii].

From the perspective of most faculty and campus administrators, performance funding is first and foremost an accountability mechanism. The 1990 THEC purpose statement just cited goes on to say that "Performance Funding . . . provides the citizens of Tennessee, the Executive Branch of state government, the Legislature, education officials, and faculty with a means of assessing the progress of publicly funded higher education" [21, p. ii].

A palpable tension exists within the academy between the twin purposes of assessment — external accountability and internal improvement of programs and services. In his case study Ewell offers the opinion that Tennessee's higher education policy makers have been more successful in "developing and reporting state-level indicators and in using them effectively to account for and promote the state's higher education system than they have been in inducing institutions to engage in their own local planning and assessment exercises" [8, p. 83]. Evidence collected from performance-funding coordinators for the current study tends to corroborate this conclusion.

Performance Funding as a Stimulus for Campus Improvement

Tennessee's performance-funding policy is responsible for a number of positive outcomes on campuses throughout the state. Most institutions have undertaken student assessment initiatives that probably would never have been implemented in the absence of the external stimulus of performance funding [2]. These activities have yielded data that have been used to improve curricula, instruction, and student services, such as advising, on some campuses. Van Dyke, Rudolph, and Bowyer [23] have described benefits, such as increased faculty attention, to general education and development of generic skills, such as writing, speaking, computing, and critical thinking. Faculty development associated with assessment has given instructors new understanding of teaching and testing techniques.

Nevertheless, the evidence of progress in promoting student achievement cited in the *1994 Annual Report* of the THEC on "The Status of Higher Education in Tennessee" [22] was scant. Students' scores on standardized tests of generic skills were equivocal, and the summary statement about student learning in major fields, "Scores on most licensure examinations remain at or above national averages" [22, p. i], did not indicate gains. Moreover, respondents to the survey we conducted gave performance funding a grade of C as a force for improving institutional effectiveness.

What can explain this lukewarm endorsement for Tennessee's performance-funding standards on the part of campus assessment leaders? First, the individuals we selected to tell us about performance funding on campus are closest to the day-to-day operation of the policy and thus may be its most candid and vocal critics. The new guidelines are much more complex than previous versions and doubling the number of standards increased substantially each coordinator's workload. Clearly these respondents were frustrated by the difficulties they had encountered in collecting data, compiling reports, and stimulating change on the basis of results. Thus the grades they assigned to the standards as measures of the quality of higher education undoubtedly were influenced by the difficulty of working with the scoring guidelines associated with the standards.

Although new measures, such as progress toward mission-specific goals, that acknowledge the need for institutions to set their own targets for improvement have been incorporated in the performance-funding standards, they require long time lines for achievement and thus have not been in effect long enough to produce observable improvements. Moreover, as is often the case in initiating new processes — especially those as complex as the ones specified in performance funding criteria — problems occurred with some of the implementation and scoring details associated with the new standards. The resulting frustration with the guidelines was reflected in some of the negative ratings and related comments given by coordinators.

As is the case with any policy that must be applied to a wide range of constituencies, the performance-funding standards represent many compromises. A standard or scoring mechanism that addresses the interests of a community college may not apply equally well to a research university. Notwithstanding the limitations of the survey that were cited in a previous section, some of the differences in perceptions about the standards show up on the numerical ratings and in the comments from coordinators representing the different sectors of higher education in the state.

The authors' own experiences with assessment tell us that the process of setting explicit goals, evaluating teaching and learning, and making the results public so runs against the grain in the academy that even fifteen years' experience with performance funding is not sufficient to convince a large segment of our colleagues that anything positive can be achieved by attempting to do this. A typical faculty comment about assessment appears in a work by Hayes: "An evaluation program may threaten perceived faculty interests, take scarce faculty time, and damage faculty morale" [11, p. 15].

Educators find fault with virtually every attempt to measure educational outcomes [9]. They correctly point to disappointingly low levels of reliability and validity for most of the methods of measurement that thus far have been devised. Even in Tennessee institutions, many of our colleagues think the public should be satisfied with cumulative grade-point averages and information about the achievements of our most successful graduates as standards for judging institutional effectiveness in promoting student learning.

If we had asked presidents, chief academic officers, or faculty leaders to respond to our survey, their views of the strengths and limitations of performance funding might have differed substantially from those of the campus coordinators. Because the policy brings in discretionary dollars that may be applied to centrally initiated priorities, administrators may well exhibit higher regard for performance-funding activities than do faculty. Few individual faculty derive any personal benefit from performance-funding dollars and thus tend to view assessment at best as peripheral to their interests.

Performance Funding as an Accountability Mechanism

Every year the THEC convenes a Formula Revision Committee for the purpose of assessing the entire program of funding for public colleges and universities in Tennessee. Each year since 1979 this representative group of campus administrators has considered the impact of the performance-funding policy and the advisability of terminating the initiative in favor of a return to the process of allocating all, not just a portion, of state funds on the basis of an enrollment-driven formula. Every year to date the committee members have decided to continue performance funding. What contributes to the high performance rating of performance funding by this influential group?

As an experiment to find a way to base funding on performance rather than simple increases in enrollment, performance funding was used successfully in 1979 to attract new funding for higher education from the Tennessee legislature. Thus performance-funding dollars represent a supplement to the budget for instruction of each Tennessee institution that chooses to pursue the supplement. Although participation is voluntary, the size of the potential reward is so substantial — more than $6 million annually for the state's largest institution — that every public institution has elected to implement every standard. The reward is several times as large as the amount spent on assessment and reporting and there are no restrictions on the ways the funds are used. Thus an institution may employ its performance-funding supplement to improve existing programs or to initiate new ones.

Faculty and administrators worry particularly about the potential for misuse of assessment data to make unwarranted comparisons among institutions with different missions. As Ewell [7] points out, comparisons play a limited role in performance funding because institutions do not compete with each other for dollars. An amount equal to 5.45 percent of its budget for instruction is set aside for each institution, and regardless of the performances of other institutions, it receives no more of this amount, and no less, than it earns according to the current guidelines for performance funding. Moreover, although institutions have been required to use some common tests and surveys in their assessment efforts, in fifteen years the comparative data have not been used systematically to disadvantage any institution or institutional type.

Performance funding has endured as an instrument of state funding policy in Tennessee, despite negative reactions by faculty and campus coordinators, principally because the THEC has used it successfully to convince influential legislators that Tennessee's public colleges and universities are accountable and deserving of additional state revenues if they demonstrate good performance. Ewell has observed that "Tennessee higher education has maintained its share of available state dollars in comparison with other agencies and functions, a pattern that is rare elsewhere" [7, p. 162]. If the performance-funding policy were withdrawn, there is every reason to believe that the funding supplement associated with it would disappear from the following year's budget.

The THEC has also succeeded in making performance funding a particularly nutritious carrot rather than an accountability stick with which to flog institutions. The program's guidelines were based initially on the experience of multi-year pilot projects conducted in a majority of the state's institutions [14], and each set of guidelines for the five-year plans has been the product of committee work by administrators and faculty representing all sectors of public higher education in Tennessee. Ewell points out that Tennessee's program has "evolved slowly" [7, p. 150] and that "those states with long-standing accountability initiatives or a clear tradition of state planning and reporting appear to have evolved far more useful approaches than those lacking these advantages" [p. 163].

Despite the inclination of academics to react negatively to the process of assessment, campus coordinators gave five of the ten performance-funding standards in the 1992–97 plan satisfactory (grade of B) ratings as measures of the quality of higher education. After fifteen years of experience with assessment for accountability purposes in Tennessee, a majority of the individuals who have observed performance funding activities most closely are willing to say that the accountability measures of peer review and surveys for constituent groups like students, alumni, and employers, as well as a planned program of improvement actions based on assessment findings are assessment methods that also improve student learning on campus. Moreover, the view from the campus is that giving institutions an opportunity to set their own goals and methods of monitoring in areas that are of interest to the state, such as increasing minority enrollment and retention/graduation rates, also holds promise for serving the twin purposes of accountability and improvement.

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Shelley M. Park

Research, Teaching, and Service

Why Shouldn't Women's Work Count?

Introduction

Despite myths concerning the efficacy of affirmative action programs, there are still relatively few women in academia. Moreover, the female professors one does encounter in the academy are apt to be found in lower-paying, less prestigious, and less secure positions [6, 12, 18, 71, 83]. Educational cutbacks combined with fewer tenure-track positions and more restrictive criteria for tenure and promotion have given rise to a "revolving door" phenomenon, wherein adjunct and junior faculty are rotated through entry level positions without serious consideration for tenure [42, 44]. This has created a new class of "gypsy scholars" [14], an intellectual "proletariat" [87] who — in order to eke out a living — move from one low-paying, dead-end teaching post to another. This proletariat is disproportionately female.

There are several explanations for this. Some people claim that women are simply not socialized to be as career-oriented or ambitious as men. Others point to the fact that women still are largely responsible for child-rearing and housekeeping, thus giving them less time and energy to forge successful career paths. Though there undoubtedly is some truth to such explanations, focusing exclusively on such external

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factors may lead us to overlook the ways in which sexism is embedded in the structures, norms, and policies of the university itself.

Organizational theorists have recently begun to grapple with the ways in which allegedly sex-neutral corporations and bureaucracies are dominated by masculine principles and structures which lead to advantages for male employees and disadvantages for female employees [1, 16, 45, 46]. Central to this analysis has been the uncovering of a gendered division of labor in corporations, which arises through the institutionalization of organizational roles that "carry characteristic images of the kinds of people that should occupy them" [46, p. 250]. Thus, certain tasks, such as managing money, may be gender-typed as masculine, whereas other tasks, such as dealing with clients, may be gender-typed as feminine, replicating the gender stereotypes that exist outside the corporation. Such gender-typing of (abstract) jobs subsequently leads to filling these occupational positions with specific persons who are biologically male or female [1]. This further reinforces the initial assumption that certain work is "men's work," whereas other work is "women's work" [45]. "Men's work" is, moreover, typically depicted as involving greater complexity and difficulty than "women's work" and thus enjoys greater status and rewards than "women's work" [1]. Hence, the gender-role segregation results in a gender-role hierarchy in which the jobs identified as (culturally) feminine and allocated to (biological) women are undervalued and underpaid.

This article examines one way institutionalized sexism operates in the university setting by examining the gender roles and gender hierarchies implicit in (allegedly gender-neutral) university tenure and promotion policies. Current working assumptions regarding (1) what constitutes good research, teaching, and service and (2) the relative importance of each of these endeavors reflect and perpetuate masculine values and practices, thus preventing the professional advancement of female faculty both individually and collectively. A gendered division of labor exists within (as outside) the contemporary academy wherein research is implicitly deemed "men's work" and is explicitly valued, whereas teaching and service are characterized as "women's work" and explicitly devalued.

The Prevailing Criteria for Tenure and Promotion

There are three criteria by which candidates for tenure and promotion are judged: research, teaching, and service; however, these criteria are not equally weighted. Though all faculty are expected to do some service, few (if any) faculty members have ever been denied tenure on the basis of insufficient service [47]. And though all faculty are expected to do some teaching, outstanding teaching will not by itself guarantee someone tenure. The decisive factor in tenure and promotion (and salary) decisions is research [14, 15, 18, 25, 26, 34, 47, 54, 84].

Research is decisive in two ways. First, research is necessary for successful promotion: if a candidate's research is deemed inadequate, no amount of teaching or service will compensate for this. Lewis cites the following example of evaluative reasoning regarding a candidate for full professor: "Her performance as a teacher and as someone who has rendered university service has been outstanding. Regrettably, her scholarship although of high quality when it has appeared has been quite limited. I sincerely believe that her record viewed without respect to such questions as affirmative action, etc. would not lead to the conclusion that she be promoted" [54, pp. 98-99]. Second, research may be sufficient for successful promotion: excellent research will counterbalance almost all other deficiencies in a faculty member's record, except complete "dereliction of duty" [47]. In the words of one untenured faculty member: "To achieve tenure . . . one need not have any service, and need only demonstrate minimal competence as a teacher; . . . research is the *only* consideration for *tenure* that actually seems to count" [25, p. 137]. Only when a faculty member's research is borderline (adequate, but not outstanding), will her or his teaching or service record become a central focus of the review proceedings. According to both statistical analyses and personal interviews, this emphasis on research in tenure and promotion reviews holds across all disciplines and all types of institutions, except two-year colleges [15, 18, 34].

The relative importance attributed to research, teaching, and service is reflected also in the ranking of activities within each of these categories of evaluation. For example, within the category of research, publishing is deemed a more noteworthy activity than presenting papers at conferences (akin to lecturing) or editing or reviewing for a journal (akin to grading). And within the category of publishing, publishing articles in scholarly journals (for other researchers) is considered more important than publishing textbooks (for students), and both of these activities carry far more weight than publishing essays in the popular media (for the general populace) — an activity typically deemed utterly insignificant for the purposes of tenure and promotion review. Finally, within the category of publishing scholarly works, publishing purely theoretical articles often ranks above publishing articles which "merely" apply theory to a problem and, typically, both of these rank above publishing educationally oriented articles [17]. Thus, one finds the pattern of prioritizing research over teaching and service replicated within the relative rankings of subspecies of research itself. The more "pure" the scholarship is (in form, content, and intended audience), the more value that research is accorded. To the degree that scholarship is "tainted" by its affiliation with teaching or service-related activities, it is devalued [6].

Similar considerations pertain to the rankings of subspecies of teaching and service activities, respectively. The more closely a teaching activity is related to research the more highly it will be valued, and the more closely a teaching activity is related to service the less likely it will be valued. Thus, for example, teaching graduate courses carries more status than teaching undergraduate courses; and both of these are ranked above administering an academic program or advising and counseling students.

Likewise, although service, in general, carries little weight in faculty evaluations, certain types of service — such as being an officer or chair of a national professional organization (an organization that sponsors a research journal and/or academic conferences) — may be noteworthy. Certainly, such professional service is typically deemed more noteworthy than university service, which, in turn, is deemed more noteworthy than community service. Service to one's campus, though expected, is considered relatively unimportant in the review process. The only exception to this may be holding an administrative post — especially if such a post is related to issues of teaching (for example, the dean of graduate studies) or, better yet, research (for example, the vice-president in charge of research). Such administrative activities will carry far more weight than membership on university committees, which, in turn, will be accorded greater significance than, for example, advising student organizations. Finally, service to one's civic community, while morally admirable, is unlikely to be considered a professional virtue when the time for promotion comes. This is so even when such public service is intimately related to one's professional expertise. In summary form the rank ordering of criteria for faculty evaluation is roughly as displayed in Table 1.

The emphasis on research publication in the contemporary academy is a primary cause of stress for faculty — especially for female faculty [84]. Yet, the general consensus within and across universities concerning the rank ordering of the faculty activities listed above implies that current institutional policies regarding tenure and promotion policies are fair and easily justified. But this is simply not the case.

Below, various rationales for the reigning faculty evaluation and reward system are examined. Unless propped up by a set of unexamined

TABLE 1
Criteria for Tenure and Promotion

Research	Teaching	Service
Publishing professional journals professional books theoretical applied pedagogical		
Publishing textbooks instructional materials		
Conference presentations		
	Classroom performance graduate undergraduate upper division lower division	
Editing/reviewing for a journal		Professional service
	Advising/counseling students	University service administration committees student clubs
Magazine/newspaper articles		Public service

presuppositions regarding the justification of a gender-role hierarchy, each of these putative justifications fails.

Research Separates the Men from the Boys . . . and the Women

Why should research be the primary criterion for tenure and promotion? One line of argument, which focuses on research as an indicator of faculty merit, goes something like this: "Research separates the men from the boys (or the women from the girls). Teaching and service won't serve this function because everyone teaches and does committee work."[1] A variation on this theme argues that "Teaching and service won't serve this function because there is no satisfactory way of evaluating teaching and service." According to the first line of reasoning, research performance is the only factor that *differentiates* faculty presumed to be equal in other respects. According to the second line of reasoning, research performance is the only factor by which faculty members can be *objectively* evaluated, even if they are unequal in other respects.

"Everyone Teaches and Serves"

Is research the only factor that will demonstrate faculty merit? Though it is true that everyone teaches and serves on committees, this line of reasoning overlooks the following facts. First, not everyone teaches the same number of courses. Course loads vary among universities, departments and even within departments. Those engaged in research are often given course reductions and/or sabbatical leaves. Secondly, not everyone teaches the same number of students. Even where course loads are similar, class sizes may be vastly different. Those who teach core courses will service many more students than those who teach specialty courses; and those who teach undergraduates will have much larger classes than those who teach graduate students. Finally, professors vary in the amount of effort they expend per course and per student. Some faculty members frequently develop new courses and assignments or redesign old ones, while others teach from the same notes year in and year out. Some faculty members assign essays, while others evaluate students by computer-graded multiple choice examinations. Some faculty members have grading assistants, others do not. Some spend hours writing detailed comments on each student essay, while others just skim and grade. Some faculty members spend hours advising and mentoring students, while others are unapproachable or unavailable even during their scheduled office hours.

Similarly, though it is true that everyone is given committee assignments, not everyone serves on the same number of committees and not everyone spends the same number of hours on committee work. Some committees meet weekly, and others meet once or twice a year. Some committee members prepare for meetings and spend time outside the meeting doing homework, seriously examining the issues, lobbying for proposals and so forth, while other committee members rarely show up for scheduled meetings.

Simply to say that "everyone teaches" obscures crucial differences among courses and among teachers. Likewise, to say that "everyone serves" obscures important differences among committees and among their respective members. In doing so, the argument for prioritizing research both exploits and obscures the gender bias in university tenure and promotion policy.

In treating teaching and service as undifferentiated activities, the argument for prioritizing research utilizes a technique commonly used to devalue women's work and, thus, rationalize the unpaid or underpaid status of that work. It assumes that there is no difference between good and bad teaching (and service) or, that if there is, this difference is unaccounted for by levels of skill, because these are activities that are *instinctual* or *natural* for those who perform them. Consider, for example, Stigler's claim that "there are, nationally, many more good teachers of undergraduates than there are good researchers" [77, p. 74]. This makes little sense if teaching is a learned skill in light of the fact that graduate students receive little or no pedagogical training but a considerable amount of research training [11]. The notion that anyone can teach well, like the notion that anyone can parent (or more specifically mother) well, *assumes* that these activities are uncreative, unchallenging, and unskilled. Similarly, the notion that anyone can perform service activities well, like the notion that anyone can be a good housekeeper or waitress, *assumes* that such activities are unskilled and require little thought or effort. As Smith argues, this is an assumption that could only arise from a specific perspective, namely the (masculine) perspective of those who do not routinely or seriously engage in such labor [76].

Teaching duties have fallen and continue to fall disproportionately to women [6, 8 18, 19, 42, 60, 71, 83, 90]. In 1980, 53 percent of male faculty at four-year institutions, but only 35 percent of female faculty, taught eight or fewer hours per week. Conversely 28 percent of female faculty, but only 15 percent of male faculty taught thirteen or more hours per week. [42]. Eleven percent of female faculty, compared to 7.5 percent of male faculty, spent seventeen or more hours per week teaching [8]. In the late 1980s, the gender gap had narrowed slightly, but female faculty were still significantly more likely than male faculty to spend the bulk of their time on teaching and teaching-related activities. In 1988 faculty women were spending, on average, 61 percent of their time teaching, whereas faculty men spent only 54 percent of their time teaching [83, p. 152]. In 1989-90, 43 percent of all male faculty, but only 36 percent of female faculty, taught eight or fewer hours per week. Conversely, 27 percent of female faculty, compared to 20 percent of male faculty, taught thirteen or more hours per week. Eleven percent of female faculty, compared to 8 percent of male faculty, spent seventeen or more hours per week in the classroom [6].

In addition to spending more hours per week in the classroom, women spend more time preparing for their classes and more time advising students than do their male colleagues [6]. This may be related to the fact that women are more likely to be assigned undergraduate and remedial classes. In 1989, 58 percent of women, but only 48 percent of men, were teaching undergraduates exclusively [19]. Twenty percent of women, but only 13 percent of men, taught remedial skills classes [6]. Yet, even among those faculty teaching undergraduates exclusively, women spend more time preparing for teaching than do their male colleagues [19].

Such disparity in teaching responsibilities is not surprising given that female faculty members are largely concentrated in ranks, disciplines, and institutions that have higher than average teaching expectations. In 1989 women comprised 45 percent of instructors, 38 percent of assistant professors, 26 percent of associate professors and and 13.7 percent of all full professors.[2] Almost half of female faculty were concentrated in health-related fields, education, English, and the social sciences.[3] Finally, women accounted for 38 percent of all full-time community college faculty, 28 percent of private four-year college faculty, 21 percent of public research university faculty, 27 percent of other public university faculty and only 19 percent of private research university faculty [1, p. 33; see also 6, 18, 62, 83]. Within the twenty most prestigious research universities, women held only 17 percent of full-time faculty positions in 1986, with a descending proportion of higher-ranked positions: 32 percent of assistant professorships, 22 percent of associate professorships, and 8 percent of full professorships [62, p. 232] Thus, women — including both white and minority women — are apt to find themselves in places and stations with fewer resources and heavier teaching loads than their male counterparts [3, 6, 90].

Moreover, one might speculate that due to disciplinary specializations combined with low rank, female faculty will carry disproportionately heavy grading and advising loads for each of the classes they teach. For example, instructors and assistant professors in English may be assigned lower-division composition courses which necessitate the frequent grading of essays and consultations with each individual student. And junior faculty in nursing, social work, or education may spend numerous hours organizing and supervising student internships. In all disciplines, faculty occupying lower ranks are apt to find themselves teaching sections of introductory or general education courses with large numbers of students, many of whom are young and in need of personal as well as intellectual guidance.

In light of the above considerations, it is not surprising to find out that tenure and promotion processes are a primary source of stress for female faculty. In its 1989 National Survey of Faculty, the Carnegie Foundation discovered that 74 percent of female faculty believed, contrary to the prevailing paradigm, that "teaching effectiveness should be the primary criterion for promotion of faculty" [18, p. 64].

Like teaching activities, service activities differ along gender lines. In addition to spending more time advising students, female faculty members engage in significantly more, and different types of, service activities than their male counterparts [3]. In 1988 the U.S. Department of Education found that female faculty, across all types of institutions, devoted a greater percentage of their time to institutional service activities than did male faculty [83, p. 153]. In 1990 the Carnegie Foundation concurred that female faculty were the most active participants in the daily campus governance process, "even though they devoted more time to the teaching function than did men, they were significantly more active in the work of the faculty senate, administrative advisory committees, and other campus-wide bodies" [19, p. 42]. Faculty women are also more likely than men to volunteer time and expertise to extra-institutional projects [83, p. 151].

There are several reasons for these differences. First, female and minority faculty members — and especially minority female faculty — may have more "opportunities" for serving student groups and community organizations, as well as individual students, because they are sought out by other women or minority members as positive role models or because of their areas of research interest [60, 71]. Second, faculty women (unlike men of color) are more likely to be approached by students with personal, as well as academic, concerns on the expectation that women will be more caring and sensitive than men [75]. Third, women, as well as men of color, are given more "opportunities" for university service than white men. For example, they may be asked to serve on various committees in order to guarantee representation of their group or simply to symbolize their institution's commitment to affirmative action and diversity goals [35, 43, 60, 63, 71]. Finally, women (unlike men of color) are thought "to enjoy and to excel in the 'pattern maintenance' chores that governance involves" [60, p. 131, see also 75, 82]. Yet, neither this belief nor tokenism extend to the more prestigious, more powerful, and better paying administrative positions.

Women still have limited opportunities to formulate university policies as presidents, vice-presidents, academic deans, and department chairs. Tenured female faculty, especially faculty women of color, are often overlooked for high-visibility and high-status administrative posts, while frequently steered toward "dead-end special" positions, such as director of minority affairs or affirmative action officer — "positions that usually have no advancement track in the academic structure" [71 p. 192; see also 5, 28]. For the most part, as Sandler contends, "women administrators remain concentrated in a small number of low-status areas that are traditionally viewed as women's fields (such as nursing and home-economics) or in care-taking roles (such as in student affairs and affirmative action) or in other academic support roles (such as admissions officer, registrar, or bookstore manager)" [71, p. 176].

In sum, though all university faculty are expected to teach and to serve, as well as to research, male and female faculty exhibit significantly different patterns of research, teaching, and service. Men, as a group, devote a higher portion of their time to research activities, whereas women, as a group, devote a much higher percentage of their time to teaching and service activities than do men. The result is that men publish more extensively than do women [3, 6, 7, 12, 18, 19, 83]. In 1979 Cole reported that, over their career, men averaged 12.6 publications compared to 7.6 for women [23]. A decade later, as more and more institutions moved into the "publish or perish" mode, the gender gap in publishing rates remained significant. Men published almost twice as many articles and books as women from 1986-88 [83, p. 156]. In 1989, 35 percent of men, but only 13 percent of women, had published eleven or more articles in professional journals; and 49 percent of men, but only 36 percent of women had ever published or edited a book [15, A-19, A-20].

These differences in "research productivity" can be explained by women's structural position in the university: women, as a group, carry heavier teaching loads, bear greater responsibility for undergraduate education, and have more service commitments. Women also have less access to graduate teaching assistants, travel funds, research monies, laboratory equipment, and release time for research [6, 19, 30, 90]. The net result is that utilizing research as the primary criterion for tenure and promotion, while devaluing teaching and service, will not separate the men from the boys (or the women from the girls) so much as it will separate the men from the women. As Harding claims, women are, in large part, assigned responsibility for domestic and emotional labor in their workplaces as well as in their homes, whereas men are assigned the "head" work. And, as in the home, these two functions are causally related. It is because faculty (and other) women manage daily domestic affairs and perform caregiving work, that faculty men are free to "immerse themselves in the world of abstract concepts" [38, p. 55]. Yet the distinctly social (as opposed to natural) character of women's work, is invisible from the male vantage point [55, 76]. Hence, inside the university, as outside it, we find a gendered division of labor wherein women assume primary responsibility for nurturing the young and serving men, but receive little credit for doing so.

"Just Say No"

A standard response to such concerns is to advise female faculty — especially those who are untenured — to "just say no" to such extra assignments. "Don't do so much course preparation. Don't serve on so many committees. Don't spend so much time on things other than research" [see, for example 2, p. 395]. There are two difficulties with this response.

First, the response is naive. It assumes that junior, female faculty can refuse teaching and service appointments with few, if any, negative repercussions. This is a dubious assumption, which demonstrates little thoughtfulness about relations of power inside the academy.[4] Junior faculty often have little control over their teaching loads, class sizes, or course assignments. The much touted "academic freedom" does not extend to the freedom to refuse teaching assignments — especially not for untenured faculty who need to prove to their colleagues that they are "team players." Nor is it easy for junior faculty to "say no" to service assignments "offered" them by their superiors (their chair, their dean, their university president — in short, those people who can effectively deny their tenure). Though they may receive little credit for accepting these tasks, untenured faculty will fear reprisal for rejecting them. This double-bind is exacerbated for female faculty whose participation on university committees raises a dilemma unique to women and minorities: "Either they must accept more committee assignments than their male colleagues or face the charge of being uncooperative in satisfying a demand [for representation] that they themselves created" [82, p 230; see also 71, 75].

In addition to being naive, the advice to refuse teaching and service obligations begs the question. Even if a young, untenured faculty person *could* refuse certain teaching and service obligations without repercussions, the notion that she *should* say "no" *assumes* that this work is unimportant or, at any rate, less important than research. But this assumption is precisely what is at issue.

Women may feel that the time they devote to teaching and advising *is* important for several reasons. First, women, like minority men, are apt to place a greater emphasis on curricular and pedagogical issues than white males insofar as they are more likely to perceive, and work to correct, biases in traditional curricula. As Rich notes, traditional disciplinary canons have repeatedly obscured and devalued the history and experiences of women: "Outside of women's studies . . . we live with textbooks, research studies, scholarly sources and lectures that treat women as a subspecies, mentioned only as peripheral to the history of man" [68, p. 123]. That women have noted this and are working to correct it is evidenced by the fact that faculty women are more likely than faculty men to develop new courses that incorporate gender as well as broader cultural concerns. Faculty women are six times more likely than their male colleagues to teach a women's studies course and more than twice as likely to incorporate readings on women or gender issues into all of their undergraduate courses. Women are also significantly more likely than men to teach ethnic studies courses, incorporate readings on racial or ethnic issues into their courses, and attend workshops dealing with issues of gender, race, and culture [6].

The style, as well as the content, of traditional pedagogy may serve to exclude and alienate women. As Belenky et al. have argued, women's ways of knowing may be stifled by the traditional lecture format, wherein the professor appears as the omnipotent authority, takes few risks, and permits the students to see only the product and not the process of his thinking [10]. This format silences women by treating them as merely the passive receptacles for someone else's truth. This silencing is further exacerbated by traditional evaluation techniques which emphasize grades based on the product, rather than the process of student learning. More conducive to women's intellectual emotional and personal) development is a pedagogy that emphasizes "connection over separation, understanding and acceptance over assessment, and collaboration over debate"; a pedagogy that "accord[s] respect to and allow[s] time for the knowledge that emerges from firsthand experience" and, instead of imposing the instructor's own expectations and requirements, "encourage[s] students to evolve their own patterns of work based on the problems they are pursuing" [10, p. 229].

That women are also (at least implicitly) aware of this and working to improve pedagogical techniques is evidenced by the fact that faculty women are significantly less likely than their male colleagues to use extensive lecturing as their primary instructional method. Conversely, women are significantly more likely to use class discussion, cooperative learning, experiential learning, field work, group (as well as independent) projects, and student-developed activities as methods of instruction. Faculty women also utilize a greater variety of evaluation techniques than faculty men. While women do utilize standard assessment techniques, such as mid-term and final examinations and multiple choice quizzes, women are significantly more likely than men to assign weekly essays and student presentations and to involve students in evaluating one another's work. Women faculty are also significantly less likely to grade on a curve [6].

In addition to spending more time on their teaching, women, like minority men, may place a greater priority on advising students because they are more likely to perceive themselves as having a special responsibility to student members of their own demographic constituency. They may be more aware of the social, personal, and academic difficulties faced by young women or young men of color on a campus marked by explicit or implicit sexual and racial politics, more knowledgeable about (institutional and extra-institutional) sources of support, and better able to provide pragmatic advice. Yet, because of the small numbers of female and minority faculty at research institutions, such a sense of responsibility may leave such faculty members feeling torn by conflicting expectations. The advice to resolve such role conflicts by simply prioritizing research is problematic insofar as it ignores the very real needs of students. In the words of one faculty member: "I prefer research . . . [but] it's not so easy — there is standard advice both to new faculty and to women — 'You don't have to spend so much time with students.' But in my case, often because they're foreign students, *they really do need time*. . . . I've spent a lot of time and . . . am trying to regain a balance" [75, p. 60, emphasis mine].

Finally, women (unlike men of color) may feel that the time they devote to their teaching is important because of their gendered ethical perspective. The advice to spend less time with students in order to devote more time to one's personal research projects encourages faculty to reason in terms of what Gilligan names a (masculine) "ethics of justice" rather than a (feminine) "ethics of care" [37]. According to Gilligan, men are trained to make moral decisions by establishing a rational hierarchy of (abstract) rights and duties, whereas women are socialized to define morality in terms of responsibilities that stem from compassion for and (concrete) connection with others. These different ethical perspectives are exemplified in male and female faculty's attitudes towards teaching. Not only do women spend more time on teaching and teaching-related activities, they also teach differently than men. As noted above, women are significantly more likely than men to utilize collaborative learning techniques. These differences in pedagogical style appear related to differences in pedagogical goals. While almost all (male and female) faculty emphasize the importance of developing undergraduates' ability to *think* clearly, female faculty are significantly more likely than male faculty to cite the *personal, professional, moral, emotional, and social* development of their students as essential goals of their teaching. In 1989-90, 77 percent of women, compared to 64 percent of men claimed that enhancing their students' self-understanding was an essential educational goal. Seventy-one percent of women, compared to 58 percent of men, aimed to prepare students for employment. Seventy-one percent of women, compared to 60 percent of men, wanted to help students develop personal values, and 62 percent of women, compared to 54 percent of men, hoped to develop their students' moral character. Fifty percent of women, but only 36 percent of men, attempted to provide for the emotional development of their students. Women were also significantly more likely than men to cite "enhancing students' out-of-class experience" and "preparing students for family living" as essential educational goals [6, pp. 63, 83]. These differences in pedagogical goals suggest that female faculty are less likely than their male colleagues to view their students (dispassionately) as merely the abstract holders of intellectual rights and more apt to connect with them (compassionately) as concrete, embodied human beings with diverse, complex needs. To the extent that this is true, women may find the advice to stop spending time with students morally problematic and difficult to heed.

For similar reasons to those given above, women (and minorities) may view their service work as important and have difficulty abandoning it. Women (and minority) faculty are more likely to devote time to service activities insofar as they are more likely than white men to perceive the need for change in the policies, procedures, and institutional structure of the university. Women (and minority) faculty are also more likely to perceive themselves as having a special responsibility to other female (and minority) faculty and, indeed, to other women (and minorities) outside of the academy. For both these reasons women may accept — or even seek out — positions on various university committees. They may also freely devote time to mentoring their more junior colleagues, give free public talks, and volunteer for community projects.

Allen notes that gender and ethnicity affect faculty workloads and research productivity and suggests that the lower research productivity of white women, African American women, and African American men is attributable, in part, to different values and priorities: "Faculty members from different demographic groups . . . have different attitudes about and expectations for academic work. [There is] a possible mismatch between institutional demands and the perspectives of women and minority faculty members" [3, p. 34]. This mismatch is exemplified by women's attitudes toward service, as well as their attitudes toward teaching. Women are less likely than men to emphasize research and significantly more likely than men to emphasize being a good colleague, providing services to the community, and participating in committee and administrative work as important professional goals. This indicates that women's professional priorities are less likely than men's to be aligned with the research priority of the contemporary academy. In 1989-90, for example, 86 percent of women cited collegiality as professionally important, whereas only 52 percent viewed engaging in research as important. And women viewed community service as equal in importance to research [6, pp. 62, 82].

The notion that female faculty should cut back on their teaching and service work in order to devote more time to their research makes sense only if one prioritizes women's *individual* efforts to advance within the system over women's *collective* efforts to transform prevailing norms and practices. It thus ignores the fact that faculty women may feel a responsibility to, and compassion for, both their female colleagues and their female students, in addition to women outside the academy [9, 56, 68]. Teaching and service activities are crucial for the personal, intellectual, and professional advancement of academic women as a group. Insofar as tenured faculty women see mentoring untenured faculty as an imposition, it will be difficult to retain female faculty. Insofar as female faculty view teaching and advising female students burdensome, it will be difficult to bring more women into faculty posts. As Rich notes, fragmentation among academic women "is merely a replication of the fragmentation from each other that we undergo in the society outside." If academic women accept the premise that their professional advancement, job security, and opportunities for scholarship "lie in propitiating and identifying with men who have some power" (for example, tenured male researchers, chairs, deans, journal editors), they will continue to find themselves "in competition with each other and blinded to [their] common struggles" [68, p. 124].

One of the primary barriers to success for female faculty is the "lack of a supportive, even hospitable, climate" [90, p. 176; see also 71]. Faculty women often cite intellectual and social isolation as a primary source of job dissatisfaction [5, 6, 90]. This isolation is perpetuated by a masculine ethic of competition and individualism. As one administrative woman says, "I find it difficult to get ahead personally if it involves competition. . . . I [do] strive to better myself . . . but always within the context of cooperating with other people; . . . some people [try] to make a name for themselves . . . at the expense of other people. . . . It has been a real problem for me. . . . I often wonder if I'm going to be successful in this kind of position. . . . I don't like competition that requires that in order for one person to win another has to lose" [2, p. 396]. Intellectual and social isolation is also perpetuated by an exclusive focus on research productivity. As one black faculty woman states: "I want to live my life. I do not want to sit in cloistered halls . . . writing academic papers for the rest of my life. That isn't a life" [5, p. 192].

In addition to being a source of personal dissatisfaction, intellectual and social isolation — often experienced most severely by minority academic women — prevents women's professional advancement. Despite the prevailing notion that academic success results solely from individual talent and hard work, "moving through the system of rewards and status requires knowing colleagues who can provide the guidance, support and astute insight into the political processes of the institution" [90, p. 177].

These considerations suggest that advising women to abandon teaching and service responsibilities for the sake of enhancing their research productivity is misguided. It is important for women to engage in teaching and service activities both for their own growth as individuals, and for their advancement as a group. Classroom and advising activities, while time-consuming for faculty women, may also provide a source of human relationship for women that makes their work more meaningful. And committee and community work may likewise fend off feelings of social isolation, in addition to providing important intellectual and professional contacts — especially for nontenured women. As the Carnegie Foundation's survey results suggest, faculty who are located at teaching institutions (liberal arts and community colleges), and those who actively participate in university governance, are more likely to perceive a "sense of community" on their campus and are less likely to leave their institution [18, 19].

In sum, the notion that women should improve their research productivity by refusing anything more than minimal teaching and service responsibilities arises from a masculine perspective that mirrors sexist attitudes that exist outside the academy. In privileging research, it values the abstract theoretical labor of men, while it simultaneously exploits and devalues the concrete emotional and domestic labor of women (wives, secretaries, research assistants, adjunct teachers, and "regular" female faculty) that makes theoretical activity possible [38, 68, 76]. In inviting "exceptional" women to join the ranks of researchers, it encourages women to likewise exploit and devalue (unpaid or underpaid) "women's work" — thus ensuring that those chosen few will remain tokens.

"But, There's No Way to Evaluate Teaching and Service"

Some individuals acknowledge difficulties with valuing research more highly than teaching and service, but argue nonethless for retaining the present faculty evaluation system on pragmatic grounds. "While the present system of measuring faculty merit may not be perfect," the argument goes, "it is too difficult to objectively measure the quality of faculty teaching and service" [see, for example, 75, p. 52]. This response denotes a lack of imagination and highlights the double standard used to evaluate research, on the one hand, and teaching and service, on the other.

It is certainly not impossible — although it may be time-consuming — to assess the quality of a faculty member's teaching and service. Though it is true that current methods of evaluating teaching are fraught with difficulties, these methods could be refined, developed, and expanded to achieve more accurate and objective results. Currently, student responses to multiple-choice questionnaires are the primary tool used in evaluating classroom performance, but the objectivity of these student evaluations of faculty has been the subject of much debate [34]. For example, there is evidence that high student evaluations of faculty correlate positively with high faculty evaluations of students and small class sizes [67, 89]. Thus, those who resist grade inflation and teach large classes may be unfairly penalized. There is also evidence that women faculty are rated more negatively by students than male faculty [71, 75].

Yet, with a little imagination (and a little research), one can easily find ways to overcome or at least compensate for these difficulties. First, the student evaluation tool could itself be refined to deemphasize the "grading" of faculty and instead emphasize students' reasons for valuing or devaluing a course or instructor.[5] Second, student evaluations could be examined alongside records of grade distribution and class size. Finally, student evaluations could be supplemented by peer evaluations, a chair evaluation, a dean evaluation, the evaluation of external referees, and a self-evaluation. The evaluations of faculty by their peers and superiors could be based on classroom visits, interviews with a representative sampling of current and former students, evidence of scholarship (including, but not limited to publication) relating to the faculty member's teaching methods or course content, evidence of new courses developed or revisions to existing courses, and samples of teaching materials, such as syllabi, reading lists, handouts, assignment sheets, tests, and copies of graded work and completed student theses and dissertations [57, 73, 86, 89]. Utilizing a diverse array of evaluators and evaluative tools should help counteract potential bias and render reasonably accurate results.

Although there has been sparse scholarship concerning evaluations of faculty service, here too one can imagine reasonably objective methods of making such evaluations. As in evaluating teaching, evaluating service should rely on a spectrum of evidence. Such evidence might include the testimony of colleagues in professional organizations, university and college co-committee members and committee chairs, departmental colleagues and chairs, members of community groups or businesses a faculty member has served, and members of student organizations a faculty member has advised. In addition to such testimonial evidence, evaluators might also examine written documents from committee and other archives, active policies and programs that have resulted from service commitments, scholarship related to a faculty member's service, and self-evaluations of service.

In addition to looking at the *quality* of a professor's teaching and service, a tenure and promotion committee should also consider the *quantity* of her teaching and service. Pertinent information here includes the number of courses taught per year (including overload teaching at branch campuses), total student contact hours (courses taught x the number of students in each course), the number of different course preparations, the number of new courses developed, the number of students assigned for advisement and placement, and the number of student theses, dissertations, practicums, and independent studies supervised. With regard to service, relevant information would include the number of professional or administrative offices held and the length of time served in those posts, the number of university committees served on (along with a rough approximation of the number and length of times those committees meet per year), the number of community presentations given, the number of student organizations advised and the length of time served as an advisor, and the amount of consulting work done.

Though one might argue that the quantity of one's teaching and service should be less important than its quality, both need to be taken into account, because women do a disproportionate amount of teaching and service and one might expect there to be an inverse relationship between the two factors. Simply put, the larger the number of students one is responsible for teaching, the less "quality time" one will be able to spend with each individual student. Likewise, the more service assignments one accepts, the less time one may have to devote to each assignment.

One might also hypothesize an inverse relationship between the quantity and quality of research. While proponents of the present criteria for tenure and promotion overemphasize the importance and difficulties of assessing teaching and service quality, they deemphasize the importance and difficulties of assessing research quality. Indeed, most evidence suggests that research is assessed merely according to quantity, rather than quality, of publication.

Over twenty years ago, the Commission on Academic Tenure in Higher Education bemoaned the results of this assessment process: "Review committees are impressed by the number of publications rather than by their significance. Extrinsic signs such as the general reputation of journals or publishers are often substituted for a positive assessment of the work itself. Nontenured members of faculties, believing that largely quantitative tests of publication prevail, lose confidence in the evaluation process and are often prompted to undertake quick projects that will expand their bibliographies, rather than to work on more difficult or more long-term projects" [cited in 86, p. 34]. Yet, in 1989 the

Carnegie Foundation reported a continued institutional emphasis on quantity of publication. Fifty-seven percent of the faculty surveyed believed that the number of publications was important in tenure decisions, and 38 percent reported that at their institution publications were merely counted, not qualitatively assessed. Among faculty at four-year institutions, these numbers jumped to 80 percent and 47 percent, respectively [18, pp. 49, 50].

This quantity over quality approach to assessing research publication encourages conservative research that can be completed within a short time. It also encourages the submission of articles for publication without the refinement of ideas that might otherwise take place. In both these ways, emphasis on "research productivity" may lead faculty to compromise their personal and intellectual values. Assistant and associate professors surveyed by Verrier reveal that they are "taking on short-term, conservative research projects, often not central to their current research interests nor tapping into their more creative energies. Research activity is directed to tasks that they believe will be rewarded — for example, attaining grants, writing a book, publishing a steady output of 'least publishable units'" [84, p. 116].

There is, thus, a double standard that pertains to the assessment of research, on the one hand, and teaching and service, on the other. Although measuring the quality of research, teaching, and service is not impossible, it is clearly more difficult and more time-consuming than simply counting the number of articles published, courses taught, and committees served on. The import of this difficulty is different, however, for teaching and service than it is for research. The difficulty of assessing teaching and service quality results in a devaluation of these activities, while the difficulty of assessing research quality results in the adoption of a quantitative approach to measurement.

Women, as a group, are negatively affected by this double standard. The emphasis on teaching quality over quantity ensures that female faculty are not rewarded for carrying higher than average teaching loads. And the emphasis on research quantity over quality ensures that female faculty will be penalized for having shorter than average publication lists. Feminists (and other innovators) will be particularly hard hit by prevailing methods of assessment. Feminist scholarship is, by definition, not conservative. It seeks to radically redefine concepts, issues, research paradigms, and pedagogical methods. This scholarship represents one of the most significant research developments in the latter twentieth century, but it is time-consuming scholarship [54]. Thus, institutional norms that emphasize quantity over quality of research will inevitably devalue the research contribution of the feminist scholar.

Research Has Instrumental Value

The arguments for prioritizing research over teaching and service examined above focus on the necessity of utilizing the research criterion in evaluating the relative *merit* of faculty members. These arguments fail insofar as "research productivity" is, at best, only one of several indicators of faculty merit. There is, however, another set of arguments for emphasizing research in tenure and promotion reviews — arguments that focus instead on the *usefulness* of research and, hence, researchers. These arguments, to be examined below, are as follows: (1) research advances and disseminates knowledge, (2) research aids teaching, and (3) research enhances personal and institutional reputation.

"Research Produces and Disseminates Knowledge"

It is often argued that research is integral to the mission of the university in that it advances and disseminates knowledge. Producing and disseminating knowledge is (and should be) a central part of a university's mission. But whether or not it is plausible to view research as the primary or, indeed, only avenue to pursuing this goal depends on how we interpret "research." It also depends on questions surrounding what sort of knowledge is produced and whom it is intended to reach. Although research, understood as an activity leading to scholarly publication, is an important method of producing and disseminating certain types of knowledge to particular groups of people, research in this narrow sense is neither sufficient nor necessary for carrying out the university's more general scholarly mission.

Publishing the results of one's experimental or theoretical investigations is not sufficient for the dissemination of knowledge. Publication depends on the prior conception, development, and completion of a successful, or at least minimally interesting, research project — a project that may have involved several acknowledged and unacknowledged persons and institutions besides those who have written up the results. One can publish, and thus disseminate knowledge, without doing the research that actually produces the knowledge. As Schiebinger notes, the history of science as a history of man-made discoveries has overlooked the fact that women "have served science well in their positions as invisible assistants" [72, p. 264]. The wives, daughters, and sisters of male scientists, barred from the public world of science and refused access to necessary resources — yet nonetheless devoted to science — often became the private (and unacknowledged) assistants to their male relatives in the nineteenth century. In the twentieth century it is not uncommon for graduate students or junior faculty members in the natural and social sciences to perform laboratory experiments, take polls, or compile statistics — much as wives, daughters, and sisters previously did — the results of which are summarized and published by their advisors or mentors. Within the academy, as outside of it, a division of labor may exist such that the person or persons who are responsible for beginning a project may not be the same person or persons who finalize that work or distribute (and receive credit for) the resulting product. To equate research and publication obscures this (often gendered and always class-based) division of labor.

Moreover, publishing in scholarly journals is not the only, nor even the best, method of disseminating knowledge. Given the typically small number of people who read most academic journals and treatises, publishing in the popular media may be a more effective method of disseminating knowledge. Yet, as already noted, current tenure and promotion criteria trivialize this activity, as the following comments from a social scientist further indicate: "My research on women and obesity had been published in the public media (where it had apparently been contaminated). The provost asked me for examples of my work and I gave him some of the press releases as an indication that the larger community was interested in it. Instead of asking me for copies of the papers on which these press releases were based, he [said] my material was not substantively academic" [78, p. 50].

"All too often," as hooks notes, "educators, especially university professors, fear their work will not be valued by other academics if it is presented in a way that makes it accessible to a wider audience" [41, p. 111]. This fear is no mere paranoia. Current tenure and promotion guidelines devalue — indeed may negatively value — research topics and styles that are interesting and accessible to a general audience, encouraging instead a form of scholarship that is both elitist and exclusionary [68]. This suggests that arguments for prioritizing faculty research based on the university's mission to disseminate knowledge may be disingenuous. If university administrators are genuinely concerned to provide intellectual ideas and discoveries to as many people as possible, they should encourage, rather than dismiss, those faculty who are interested and skilled in reaching mass audiences.

Teaching, conference presentations, and community talks are also effective, yet devalued, methods of disseminating knowledge. Like publishing in the popular media, these methods of spreading knowledge undoubtedly reach a greater number and more diverse groups of people (including more women) than are reached by publishing in academic journals. Unlike publishing in any print media, however, these oral methods of spreading knowledge have the advantage of reaching people who cannot read or write. Until everyone in this country is literate, intellectual ideas must still be spread by word of mouth. In addition to reaching a wider and more diverse audience, oral methods of communication also have the advantage of permitting the audience to "ask questions, clarify issues, give feedback" [41, p. 110]. Thus these alternative methods of reaching people might help to extend and transform, as well as disseminate, knowledge.

"Better Researchers Are Better Teachers"

Because it seems *prima facie* reasonable, at least to taxpayers, parents of students, and students themselves, to see a professor's primary responsibility as that of teaching, many university administrators have begun to emphasize the connections between research and teaching. We are told that "professors actively involved in research will be better teachers." Is this true? Not necessarily. Whether or not research involvement enhances our teaching depends, once again, on how we define research. It also depends on whom and how we teach.

The expectation that doing research will improve a faculty member's teaching is based largely on the assumption that "scholarship makes a professor more knowledgeable and that a more knowledgeable professor makes a better teacher" [31, p. 145].[6] But this is simply not true if we equate scholarship with research, measured in terms of number of publications. Indeed, Friedrich and Michalek discovered that "more active researchers are seen as being less knowledgeable. This result is consistent with the argument that research may increase a teacher's knowledge in a specific area at the expense of more general knowledge. . . . Immersion in research apparently can breed a narrowness that detracts from the broad-based knowledgeability that students perceive as being an important element of good teaching" [31, pp. 153, 160].

Research, as defined for the purposes of tenure and promotion reviews, is an activity that results in a finished *product* — a journal article, book, or other creative work.[7] Scholarship that contributes to faculty knowledgeability and hence to good teaching, however, is best understood as professional development — doing library work, reading, making inquiries, attending workshops, using computers, improving one's communication skills, and so forth. Faculty women spend more time than faculty men on these sorts of professional development activities [6, 83]. This aspect of women's scholarship may not result in a concrete product and is best understood as an ongoing *process* [13, 14].

In sum, although there is a plausible connection between *professional development* and good teaching, the connection between *publishing* and teaching is more dubious. An effective teacher must be knowledgeable about her subject matter, including recent developments in her field, but it is not necessary for an effective teacher to have a long list of publications or the notoriety that may come with such publication [11]. Attending conferences, workshops, reading relevant materials, and honing certain skills may be sufficient. Indeed, doing more than this may, and in many instances does, detract from the quality of one's teaching.

There is an overwhelming amount of evidence which suggests that, in general, faculty make forced choices between teaching and research. Over half of the faculty surveyed at research and doctorate universities claim that at their institution "the pressure to publish reduces the quality of teaching" [18, p. 51]. And although some empirical studies suggest that the pursuit of research enhances teaching effectiveness [30], most studies of the relationship between research and teaching suggest either that they vary independently, or that they are negatively correlated [3, 11, 14, 15, 27, 31, 52, 60, 61]. The most recent studies typically suggest that teaching and research may have been complementary in the past, but now stand in an inverse relationship with more research coming at the expense of teaching time. Allen explains this as follows: "A generation ago, faculty members resolved conflicts between teaching and research by expanding their workweeks. But the eight-hour growth to a fifty-three-hour workweek makes future increases unrealistic, and faculty members invest hours at the margin to rewarded and recognized activities" [3, p. 30]. As Keohane suggests, while discovering and sharing knowledge are related, "at the pragmatic level of the disposition of professorial time and the deployment of resources, research and teaching often do conflict. Time spent in the laboratory or library grappling with a research problem competes with time spent elsewhere, including the classroom. Time spent preparing to convey knowledge to undergraduates in terms that will be sensible to them is time not spent describing the results of one's research to informed colleagues. Following up on a graduate seminar over coffee in the common room takes time that might have been spent at the computer writing the next grant proposal" [51, p. 105; see also 22].

These considerations suggest that the present argument is also disingenuous [61]. Surely university administrators recognize — certainly they should recognize — the time allocation problems that current faculty face. Moreover, if a primary value of research is its perceived benefits for teaching, then one might wonder why teaching activities are less respected and rewarded than research activities.

Nonetheless, the assumption that teaching and research are complementary rather than competing activities may make sense if one teaches specialized, senior, or graduate level courses [42, 52]. Although, in general, time spent on research will take time away from teaching and vice-versa, "it is also conceivable that particular types of teaching may have complementary effects on research activity, thus enhancing an individual's research record and likelihood of promotion. . . . For instance, graduate level teaching might increase access to high quality advisees or graduate research assistants. Also, teaching courses in one's specialty might complement an individual's research activities" [52, p. 152].

Boyer likewise suggests that scholarly investigation and classroom instruction will often mesh in the context of a graduate seminar, noting, "At that level, faculty and student cultures intersect and, further, graduate faculty often have a very light teaching load to accomodate their research." "But," he continues, "at the undergraduate level, and most especially in general education courses, research work often competes with classroom obligations, both in time and content. Faculty assigned to teach such courses frequently must take shortcuts in their research or rely heavily on teaching assistants — an arrangement that is often less than satisfactory for both student and professor" [15, p. 55].

Once again, this suggests that current tenure and promotion guidelines are a source of job stress for faculty. Junior female faculty will suffer a distinct disadvantage, because they not only carry heavier teaching loads but are significantly less likely to be assigned graduate courses [52, 60]. Whereas faculty teaching graduate courses (predominantly male) need to know a lot about a little, faculty teaching lower-division, general education, undergraduate courses (disproportionately female) need to know a little about a lot. The former more specialized knowledge will, but the latter more general knowledge will not, easily translate into publication.

"Research Enhances Reputation"

Despite all this, if one desires to enhance one's academic reputation or advance one's academic status, one must publish — often and in the right places. One's name must regularly appear in print in relevant journals, periodicals, conference proceedings, and citation indexes in order to achieve professional recognition within one's field. In the contemporary academy it is professional recognition in this sense that counts, but once again we should ask whether or not this is what *should* count, or at any rate whether or not this is *all* that should count. Why should research, in the sense of publication, be "the currency of the realm" [81, p. 462]?

One final — although not very persuasive — rationale for rewarding publishing researchers more highly than effective teachers or servers concerns the prestige that research brings to an institution. In a nutshell, the argument is that hiring, retaining, promoting, and otherwise rewarding those who do research will enhance a university's — and a university administrator's — reputation. As Cole notes, the current emphasis on faculty research productivity stems from competition among universities "to be 'the best' and to be *perceived* as among the best." Such perceptions, he contends, "will not result from hiring and promoting those who have extraordinary track records as teachers," but will instead come from hiring faculty "whose research publications are envied by others; . . . institutional legitimacy is obtained predominantly through research achievements. That is what academic leaders have coveted; . . . research excellence is a measure of an academic leader's performance in office . . . [and] legitimates the university's claim to greatness" [22, p. 24; see also 61].

This response is useful in highlighting the fact that a university does not operate in isolation, but instead operates as part of a (relatively homogenous) higher education system [15]. Thus, the value placed on research *within* a particular institution reflects (and is reflected by) the value placed on research *among* universities. Yet, the response fails to be persuasive because — like other arguments considered above — it largely begs the question. We still want to know *why* research should be so highly prized, envied, and coveted.

The arguments for ranking universities on the basis of their research output parallel those offered in support of promoting faculty on the basis of their research productivity, and they suffer the same flaws. One argument suggests that because all universities and colleges provide classes and serve their constituencies, research is the only means of *differentiating* academic institutions. This argument, like the argument for treating research as the sole indicator of faculty merit, treats teaching and service as homogenous activities. But, this overlooks the unquestionable differences in the quantity, quality, types and sizes of classes, and the wide variety in students' campus experiences, from one institution to another [14]. Likewise, it ignores differences in the quantity, quality, and types of services offered among institutions and the alternative constituencies served by different institutions.

A second argument admits these forms of diversity among universities, but maintains that research excellence is, nonetheless, the only way to *objectively* evaluate (and rank) academic institutions. In the words of one administrator, there is no "trustworthy interinstitutional metric" for judging the quality of an institution's teaching or service comparable to the one available for judging an institution's research excellence [51, p. 106]. This argument, like the pragmatic argument for using research productivity as the primary indicator of faculty merit, suggests a lack of imagination. One suspects that the absence of an "interinstitutional metric" for evaluating teaching, advising, and service is the result, rather than the cause, of a devaluation of these activities.

Tuchman, Gapinski, and Hagemann suggest that greater recognition accrues to research than to teaching and service because "the output of researchers is more visible, consisting of articles, books, and other published pieces which often attract a national audience. . . . [Teaching and service] activities are more inclined to receive local rather than national recognition" [80, p. 93]. This raises two further questions: Why is national recognition more important than local recognition? And why (and to whom) is research more nationally visible?

To be nationally rather than locally recognized, in the present context, is not tantamount to being visible to more people. Nor does it entail being visible to a more diverse range of people. Teaching and service-oriented faculty are visible to large numbers and to a diverse group of people — students, department and university colleagues, members of community, public and business organizations, and so forth. Research-oriented faculty, on the other hand, may be visible to a relatively small number and to a homogenous group of people — other academics at other universities whose (typically narrow) areas of research interest match their own.

Thus, although publishing may be both necessary and sufficient for enhancing a narrow academic reputation *within* small (albeit national) academic circles, it is not necessarily the most effective method of building good will that goes *beyond* those circles. Teaching and community service are integral to building a personal and institutional reputation among one's students and members of one's local community for honesty, integrity, fairness, caring, and compassion. Building such an institutional reputation is unlikely, however, if the faculty within a university are only rewarded — indeed, only retained — for single-minded efforts to produce lengthy, jargon-filled treatises on topics of interest only to fellow specialists.

Redefining Scholarship and Women's Roles as Scholars

It is only by virtue of the ambiguity of the term "research" that arguments for prioritizing research as a criterion for tenure and promotion appear plausible. Research, conceived as a search for truth, is an important factor in expanding the boundaries of knowledge. But research, measured in terms of quantitative output, mitigates against the development of novel ideas and approaches. Research, understood as professional development, is an important factor in pedagogical effectiveness. But research, in the sense of scholarly publication, favors disseminating specialized knowledge to an elite circle over providing general knowledge and useful skills to a diverse public. Yet, it is only research, narrowly understood as publication and measured quantitatively, that counts substantially toward individual and institutional advancement. When it is said that research is integral to the mission of the university, therefore, we must be careful to scrutinize what, precisely, is meant by research. We must also initiate a serious dialogue concerning what, exactly, the mission of the university is.

The Mission of the University in Historical Perspective

For the past several decades, the prevailing assumption has been that the mission of the university is "to advance, disseminate and apply knowledge" in that order [6, 51, 65, 66]. "Basic" or "pure" research has been prioritized with teaching and public service tacked on as ancilliary goals. The mission of the university has not always been conceived this way, however. The contemporary American research university is "a hybrid" of several earlier traditions [51, p. 103].

In the seventeenth and eighteenth centuries, the mission of the academy was largely a *moral* and *spiritual* one: "the colonial college . . . focused on the student — on building character and preparing new generations for civic and religious leadership" [15, p. 3]. American colleges, such as Harvard, were built on the British undergraduate teaching model, where students were the central focus of academic life, and faculty were hired to serve as "educational mentors" within and outside of the classroom [p. 4]. This conception of the mission of the academy, which respected teaching as a vocation, continued into the nineteenth century at institutions such as Harvard, but was slowly transformed by an alternative conception advanced by the nation's first technical schools.

From the early nineteenth to the early twentieth century, the mission of the academy came to be viewed as largely a *practical* and *economic* one: higher education's focus shifted "from the shaping of young lives to the building of a nation" [15, p. 4]. Early technical schools emphasized the goal of training young people to build railroads, bridges, and other parts of the American infrastructure. Colleges such as Harvard, while still emphasizing classroom instruction, began to link teaching to the institution's role "in the service of business and economic prosperity" [p. 4]. In the latter half of the nineteenth century, the new land-grant universities focused on providing knowledge that would improve agriculture and manufacturing. Thus, "American education, once devoted primarily to the intellectual and moral development of students, added service as a mission." Although Stanford's president may have overstated the case, declaring in 1903, "The entire university movement in the twentieth century is toward reality and practicality," most agreed that higher education was justified in terms of its usefulness [15, p. 5].

Only recently has the mission of the academy come to be viewed as largely a *theoretical* and (allegedly) *objective* one. While research began to emerge as a central part of the university's mission in the mid-nineteenth century, the university's research agenda was, at that time, practically indistinguishable from its teaching and service goals. "Professors were hired to teach the science that was already known" so that students could apply this knowledge in their work and communities — "to add to that knowledge was not expected" [88, pp. 5, 51]. By the latter part of the nineteenth century, however, the universities of Pennsylvania, Harvard, Columbia, Princeton, and the newly founded University of Chicago began to emphasize graduate education modeled on the Ph.D. programs of the German research university — a model that required original research culminating in the doctoral dissertation. By the turn of the century evaluations of faculty at several institutions were also beginning to stress the importance of research productivity. At these institutions research became sharply distinguished from teaching and service. Though undergraduate education remained a function of the university, "for many professors, class and lecture work became almost incidental." Service likewise became devalued: "Some even considered it a violation of the integrity of the university, since the prevailing Germanic model demanded that the professor view the everyday world from a distance" [15, p. 9].

With the exception of the German-inspired research universities, however, most universities and colleges continued to define their mission in terms of undergraduate education and service until the mid-twentieth century. Until World War II, "academic concerns were primarily practical and local, not theoretical and national" [65, p. 199]. During World War II, however, service took on a more national perspective and scientific research gained public recognition as integral to the security of the nation. Federal funding for research increased dramatically over the next four decades, and the research priority which had previously characterized only a few institutions became widely shared [65]. Today, undergraduate education and community service goals have been overshadowed by an emphasis on graduate education and research at almost all academic institutions. With the exception of two-year colleges, postsecondary institutions have shifted their focus "from the student to the professoriate, from general to specialized education, and from loyalty to the campus [and local community] to loyalty to the profession" [15, p. 13].

In the post-cold war period, however, the public has become increasingly skeptical concerning the justification of research institutions' "claims on the public purse," and federal research monies have been drastically reduced [65]. More generally, the public has questioned the accountability of the academy and academics, as faculty retreat from the classroom to pursue esoteric research projects that seem increasingly disconnected from both national social concerns and local community needs. Decreasing federal funds for research and declining public support for higher education has left academic institutions competing for increasingly scarce resources at the same time that research costs are escalating and student enrollments are burgeoning [61]. Yet, the research emphasis among and within universities has remained largely unquestioned. One result has been, as suggested above, "the emotional and economic exploitation of women" for the sake of "the 'work' of a few men" [68, p. 124]. Less external research monies, combined with an increased internal emphasis on the importance of research has made current tenure and promotion criteria increasingly difficult to meet. This has been especially true for women who may have little time (and in some cases little inclination) for grant-writing and article-publishing given their extensive teaching and service responsibilities and their tendency to take these responsibilities seriously.

An Alternative Model for Evaluating Faculty: Rereading Boyer through Feminist Lenses

Women — and those who care about women's place in the academy — can respond to this situation in two ways: by problematizing women or by problematizing the criteria by which women (and others) are evaluated. The favored response, thus far, has been the former. Even "progressive academics" whose scholarship emphasizes "the importance of critiquing and resisting racist and/or sexist discourse . . . rarely problematize the elitist practices and division of labour which produce 'superior thinkers' and 'proper scholarly practices of conceptualizing' in their own workplaces" [59, p. 120]. Women have been mentored (when they have been mentored at all) to cut back on the time they devote to teaching and service in order to concentrate on their research. The assumption underlying this advice — usually given by well-intentioned liberals, including liberal feminists — is that individual women can improve their situation if they choose to. This assumption portrays the successes and failures of women as the consequence of freely made personal choices, thus ignoring the fact that the university's current organizational culture depends upon a gendered division of labor.

Additionally, as noted above, advising women to refuse anything more than minimal teaching and service responsibilities in order to pursue their research arises from a masculine perspective that mirrors sexist attitudes outside the academy. Such advice assumes that child-rearing (teaching, advising, mentoring, and nurturing students), homemaking (departmental and institutional service), and volunteer work (community service) are unimportant, uncreative, and unchallenging tasks. No satisfactory argument is given as to why such tasks are unimportant — or at least less important than individual research. Instead this is simply assumed from the outset.

Yet clearly, this assumption is problematic. After all, the survival of an academic institution depends on the willingness and ability of *some group of people* to teach classes, advise students, manage day-to-day operations, and build and maintain community relationships. Developing good teacher-student and university-community relations is especially important within the current social context wherein higher education is rapidly losing public support. Yet, as long as these tasks remain depicted and devalued as "women's work," few male faculty will choose these roles. As we have seen, the group of people who currently fill teaching and service roles are women. Some of these women are also successful researchers — what Astin and Davis term "superacademic women" [6], but the majority are increasingly drawn from a surplus-labor pool of (so-called) part-time faculty who are underpaid, receive few benefits, and have no access to the resources necessary to transform their position to that of a "regular" (that is, tenured) faculty member. This suggests that feminists need to urge a reevaluation of the reigning faculty evaluation system.

One way to transform the university into a place that truly values women and fairly evaluates women's contributions is suggested by recent (re)definitions of scholarship [15, 26]. Boyer, for example, urges university faculty and administrators to overcome the myopic definition of research as the production of scholarly articles and books and to focus instead on scholarship, (re)defined broadly as encompassing the scholarship of discovery, integration, application, and teaching [15, p. 16]. Although Boyer does not argue for this expanded definition of scholarship on explicitly feminist grounds, both his thinking and his conclusions are conducive to feminism and suggest a set of criteria for tenure and promotion that would be more woman (and feminist)-friendly than those currently in place.

The scholarship of discovery "comes closest to what is meant when academics speak of 'research'" [15, p. 17]. It includes research publication that contributes to "the stock of human knowledge," but emphasizes "not just the outcomes, but the process, and especially the passion

[that] give meaning to the effort" and contributes to the intellectual atmosphere of a campus. This is consistent with feminist disavowals of the passion/reason dichotomy, as well as contemporary feminist revisionings of knowledge as an ongoing process [24, 36, 38, 39, 74, 79]. Moreover, in moving away from an exclusive focus on the product of research, the scholarship of discovery avoids the commodification of knowledge and the related devaluation of the producer (the laborer) vis-a-vis the marketer (the publisher). Finally, the scholarship of discovery, as reconceptualized here, is viewed as meritorious by virtue of its local (campus), and not merely its national (professional), contribution.

The scholarship of integration is closely related to the scholarship of discovery but emphasizes "the connectedness of things." It involves "doing research at the boundaries where fields converge" and thus emphasizes the importance of interdisciplinary research, such as that undertaken by many women's studies faculty. The scholarship of integration further emphasizes the need to interpret (both old and new) discoveries by "illuminating data in a revealing way" and "fitting one's own research — or the research of others — into larger intellectual patterns" in order to overcome the "pedantry" that can result from overspecialization [15, pp. 18, 19]. Feminist theory is integrative in just this way — it seeks to synthesize the results of investigation and detect patterns [33].

As suggested above, however, theory should not be disengaged from practice. While feminist scholarship requires a commitment to connecting disciplines, drawing together ideas, and reinterpreting evidence, it also requires connecting research to teaching and service, drawing together people and reinterpreting the role of the academic (and the academy) in the larger community. These latter activities would be encouraged by tenure and promotion criteria that emphasize the scholarship of application and teaching alongside the scholarship of discovery and integration.

The scholarship of application ties research to service by encouraging the scholar to ask "How can knowledge be responsibly applied to consequential problems? How can it be helpful to individuals as well as institutions? And further, can social problems *themselves* define an agenda for scholarly investigation?" [15, p. 21]. Thus, the scholarship of application encourages the scholar to passionately engage with, rather than dispassionately study, the world. It also requires scholars to be responsible for both the direction and the consequences of their research. In both these ways, it supports the feminist contention that researchers must give up the flawed distinction between objectivity and subjectivity

[21, 24, 36, 38, 39, 48, 56, 79]. The scholarship of application recognizes a dynamic relationship between the intellectual and the personal, between theory and practice. Personal experiences and social and political concerns may give rise to intellectual analyses which are tested by further experience and experiment. Theorizing suggests new ways of designing environmental policies, treating illnesses, engineering buildings, solving economic problems, and serving local communities; the practical application of ideas, in turn, tests theories and gives rise to new intellectual understandings. Thus, rather than devaluing service as trivial, nonintellectual or even anti-intellectual (because personal commitments compromise objectivity), an institution that acknowledged the scholarship of service would value service as "serious, demanding work," which produces as well as applies knowledge [15, p. 22].

Finally, the scholarship of teaching ties research to teaching, by emphasizing that "good teaching means that faculty, as scholars, are also learners" [15, p. 24]. Good teaching is not something that anyone can do; it requires knowledge of one's subject matter and the ability to organize, synthesize, and communicate that knowledge in meaningful ways to a nonspecialized audience [11, 61]. More importantly, it requires the ability to "stimulate active, not passive, learning" and provide students "with the capacity to go on learning after their college days are over." Thus, effective teaching requires a willingness to interact with students, to engage them in discussion, encourage them to think critically and creatively, listen to their comments and questions, and to "be pushed in new creative directions" oneself [15, p. 24]. This portrayal of good teaching is consistent with feminist and multicultural models of pedagogy, which view teaching as a collaborative endeavor most likely to succeed where classes are transformed into learning communities [9, 10, 55, 59, 74]. Moreover, the model of teaching suggested here deemphasizes the mere "dissemination" of knowledge and reemphasizes both the importance and the difficulty of reproducing (and empowering) knowers. Thus, an institution that acknowledged the scholarship of teaching could no longer trivialize this facet of academic "women's work."

The university, as we currently encounter it, is — as Rich suggests — "above all a hierarchy" [68, p. 124]. Moreover, it is a hierarchy built on the exploitation of women: the contemporary research university replicates the patriarchal family wherein fathers are breadwinners, mothers are domestic laborers, and prodigious daughters are encouraged to identify with their fathers and brothers more strongly than their mothers or sisters [68, pp. 125, 129]. If we are to transform the university into a more woman-centered institution, then we must begin by deconstructing this gendered hierarchy. A primary focus of this effort must be the prevailing criteria for promotion and tenure.

Following Boyer, revised criteria for faculty evaluation might be depicted, nonhierarchically, as in Figure 1. As this figure indicates, these various academic functions are interrelated: application of existing knowledge may result in discoveries that can be integrated into the curriculum, and which may, in turn, prompt new interpretations of evidence, and so on. Yet, analyzing these faculty functions serves to highlight the diversity of faculty talents and contributions that deserve recognition in the tenure and promotion process. In order to assess fairly each faculty member's contributions and skills, we will need to develop an equally diverse set of evaluative tools. As suggested above, this is not impossible. Yet, it is complex and time-consuming. Hence, succeeding at this task will require considerable and diverse resources, and participation in this effort should itself be rewarded.

Notes

[1] Here and below, the arguments offered in favor of the prevailing tenure and promotion paradigm are gleaned from conversations with colleagues and administrators in formal and informal settings. Explicit arguments for prioritizing research productivity in evaluations of faculty are rarely found in the published literature, demonstrating that

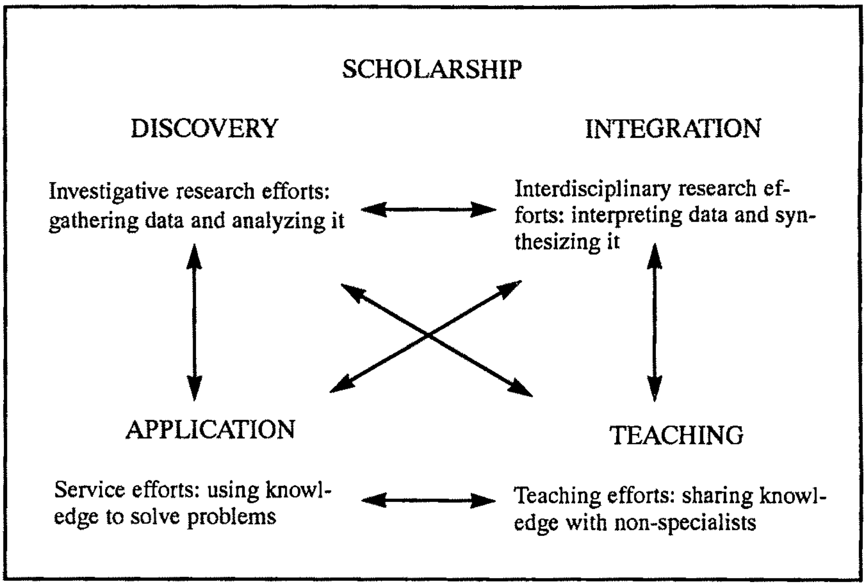
SCHOLARSHIP
DISCOVERY
INTEGRATION
Investigative research efforts: gathering data and analyzing it
Interdisciplinary research efforts: interpreting data and synthesizing it
APPLICATION
TEACHING
Service efforts: using knowledge to solve problems
Teaching efforts: sharing knowledge with non-specialists

FIG. 1. Scholarship Reconceptualized Following Boyer [15]

this paradigm is the current "null hypothesis" [22]. The burden of proof is assumed to fall to those who would contest this paradigm.

[2] Minority women, as women in general, were concentrated in lower ranks, comprising 7 percent of instructors, 5 percent of assistant professors, 3 percent of associate professors and 1.4 percent of full professors. Minority men while comprising a relatively small proportion of faculty (like minority women) were fairly evenly distributed across ranks, indicating they have been more successful than minority women in gaining promotion, but less successful than white men.

[3] Here again both white and minority women follow similar patterns of concentration, while minority men are more evenly dispersed across disciplines than women, but less evenly dispersed across disciplines than white men.

[4] As Frye notes, "Differences in power are always manifested in asymmetrical access" [32, p. 103]. Superiors can refuse access to subordinates, but those who are subordinate (in this case, junior faculty) cannot easily refuse access to their bosses (in this case, chairs, deans and upper administrators).

[5] This would also have the welcome effect of better enabling faculty to improve their courses.

[6] It might also be argued that active involvement in research makes a teacher more lively, enthusiastic, interesting, challenging, and organized. The only variable linking research to effective teaching, however, is organization. And it is plausible to suggest that good organizational skills are a source, rather than an effect, of good research [31].

[7] This article emphasizes the importance of scholarly publication to successful tenure and promotion outcomes. This emphasis, like the university's emphasis, is problematic for those faculty who work in the visual or performing arts. The contributions of painters, photographers, sculptors, actors, and musicians — like the contributions of women — would be better recognized by the revised criteria for tenure and promotion suggested at the end of this article.

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W. Cris Lewis

Retirement Wealth, Income, and Decision Making in Higher Education

Introduction

The aging of America's population means that increasingly large numbers of workers will reach the typical retirement age of 65 in the next 15 years. This is especially true in higher education, which experienced very rapid growth in both students and faculty in the 1960-75 period.[1] This rapid growth has led to concern that there will not be adequate numbers of new terminally qualified replacements[2] and that we face a "crisis" in the form of a "shortage" of college and university professors. At the same time, recent changes in employment law have eliminated the use of a mandatory retirement age in most industries, now including higher education. Now some analysts are predicting a different kind of crisis; namely, that too many professors will maintain their employment beyond age 65, thus reducing the number of job openings for new, perhaps better trained faculty members and slowing the flow of "fresh blood" into the universities, which may have negative impacts on both teaching and research output. One response to this concern has been the adoption of "early retirement" programs that provide additional payments for retiring prior to age 65, or in at least one case, at age 65.

Clearly, the differential characteristics of college/university retirement programs for faculty members provide differential incentives for retirement. This article examines the structure of such retirement programs in the context of providing incentives for retirement as well as for continued employment. A fundamental determinant of the incentives provided is whether the individual's objective is wealth accumula-

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tion or the provision of income for years of leisure. For many faculty members, their holdings in various retirement accounts are their largest single asset, often dwarfing other assets. In this article examples of the development of "retirement" wealth are developed. For individuals entering higher education today, it is expected that by age 65 real assets in retirement accounts will exceed $1,000,000, even under fairly conservative assumptions. If elimination of mandatory retirement ages and the increase in the age of eligibility for full Social Security benefits (that is, age 67 by the year 2022) result in later retirement ages, the accumulation of funds in retirement accounts will become even larger.

The article is organized as follows. First, I review the current state of retirement programs at U.S. colleges and universities, followed by a brief review of the literature on the economics of retirement. Next, I consider a model of the individual retirement decision, in which the relevant issue is the trade-off between increased leisure time and greater wealth. Estimates are made of the accumulation of retirement assets and potential retirement income for a typical professor, and the possible effects of early retirement incentives on the decision to work are explored. Finally, I discuss the special characteristics of retirement wealth, arguing that the advantages of tax sheltering both the periodic contribution and the return on the fund until retirement are partially offset by constraints on withdrawing the funds and several special tax rules.

The Typical University/College Faculty Retirement Program

The retirement program for faculty members at virtually all U.S. universities includes the following: (1) a basic retirement program involving either a "defined-benefit" plan or a "defined contribution" arrangement;[3] (2) mandatory participation in Social Security with "contributions" (that is, taxes) being paid by both the university and the individual and credit for retirement benefits being built up over time; (3) voluntary participation in other tax-sheltered annuity programs that allow the individual worker to contribute additional amounts, usually on a tax-sheltered basis each year (for example, a Supplemental Retirement Annuity or SRA); and (4) some type of additional incentive to retire at or before age 65 — this is offered by about one-half of all colleges and universities in the United States. Such incentives may pay partial salary to qualifying faculty members for several years or liberalize payments under a defined-benefit programs. Finally, faculty members with outside earned income may participate in other retirement plans such as those provided under KEOGH and IRA/SEP legislation, which allow tax-sheltered contributions to IRS-approved retirement accounts.

The ability to shelter both current wage income and the annual return on assets from federal and state income taxes provides a powerful incentive to participate in these programs. It seems unlikely that the "typical" professor has significant time or opportunity for business ventures and, therefore, tax-sheltered saving through such retirement plans may be the best investment alternative for many. Further, it is the author's personal experience that faculty members are quite aware of the general advantages of these programs and the specifics of their individual accounts.[4]

In 1994 the author surveyed colleges and universities in the United States to assess the status of retirement programs for faculty members. The survey was done in two phases. In the first, 100 institutions, including a private and public college or university in each state, were asked to provide information about their basic retirement program. There were 51 responses about equally distributed between public and private institutions. All reported having some type of retirement program that was at least partly funded by the institution. Of this group, 21 offered a defined-contribution plan only, 3 offered a defined-benefit plan only, and 24 offered a choice of one or the other. Most of the defined-benefit plans include the Teachers' Insurance and Annuity/College Retirement Equities Fund Program (TIAA/CREF) either as the only option or as one of several alternatives, and a state-sponsored plan was the typical defined-benefit alternative. Of the 45 institutions offering a defined-contribution plan, 36 provided information on both employer and employee contribution rates. The mean contribution to a defined-contribution plan was 8.9 percent of salary for the employer and 4.5 percent for the employee. The frequency distribution for these contribution rates is shown in table 1.

In the second phase, another group of two schools in each state was surveyed to ascertain the existence and details of any early retirement incentive.[5] Of this group, 52 responded, of which 23 (44.2 percent) currently offer an early retirement program, and another 8 (15.4 percent) had offered such incentives in the past. These incentives include liberalization of a defined benefit (for example, by adding additional years to age and/or length of service for qualified employees in formula calculations) and various kinds of lump-sum payments for retirement prior to age 65. For example, at Utah State University, the program offers 20 percent of salary per year for up to six years (but not beyond age 65) for employees who are at least 59 and who have at least sixteen years of service. At age 59, that is roughly equivalent to a lump-sum payment

TABLE 1

Frequency Distribution of Individual and Employer Contribution Rates to College-University Defined Contribution Retirement Programs

Contribution Rate	Number (Percentage)[a] Individual	Employer	Total
0	6 (16.7%)	—	—
0.1- 3.0%	8 (22.2)	—	—
3.1- 6.0	18 (50.0)	7 (19.4)	1 (2.8%)
6.1- 9.0	2 (5.6)	8 (22.2)	3 (8.3)
9.1-12.0	2 (5.6)	18 (50.0)	10 (27.8)
12.1-15.0	—	3 (8.3)	16 (44.4)
15.1-18.0	—	—	4 (11.1)
18.1-21.0	—	—	1 (2.8)
over 21.0	—	—	1 (2.8)

SOURCE: Unpublished survey data collected by the author.
[a]of 36 institutions reporting contribution rates

of 1.2 years of salary.[6] The objective of such an early retirement incentive is to encourage retirement by offering a partial salary prior to the normal retirement age and then using the residual to hire a young faculty member. For example, the program just described would leave 80 percent of a retiree's salary available for hiring a replacement whose training may be more current and whose energy level may be higher than that of the older faculty member.

Background

There it is a rich literature base on the economics of retirement (see Hurd [12]) for an excellent review article), although relatively little has focused on the retirement decisions of university faculty. For example, Boskin [3] and Boskin and Hurd [4] examined the impact of the Social Security program on retirement decisions. Quinn [14] found that health status and eligibility for Social Security benefits are the most important determinants of retirement. Fields and Mitchell [9] concluded that workers with greater wealth retire earlier and that those who expect to gain more by deferring retirement do retire later. Chronister and Trainer [8], Baltz [2], and Hogarth [11] examined the design and effectiveness of early retirement incentives.

In an important article focused on university employees, Soldofsky [15], argued that their retirement decisions should focus on a comparison of after-tax cash flow from continuing to work to the cash flow available from Social Security and retirement programs. His data on actual retirement age for personnel at the University of Iowa indicated a positive relationship between employment status and retirement age.

On average, nonprofessional employees retire at 62; the modal retirement age for professional and technical employees is 65, and faculty members (the highest paid group) tend to retire at 68. All of these workers are covered by the same (TIAA/CREF) retirement program. It was shown that many of these faculty members worked beyond the age where retirement cash flow would exceed working cash flow, and it was suggested that there may have been an element of irrationality or lack of information in their decisions. Four explanations were offered: (1) faculty members were worried about continuing inflation that might erode the real value of retirement benefits; (2) the retirement income projections included in the TIAA-CREF annual reports are unduly conservative and understate probable levels of such income; (3) faculty members may have received poor advice from the staff in the university benefits office;[7] and (4) they may have observed other retirees and made inferences about them having less real cash flow during retirement. Similar concerns were indicated in a survey of retirees by the Carnegie Foundation [7].

By Soldofsky's standard, it would appear that the best educated and best paid group (and, of course, the group with the largest retirement account balances) are the least rational about their retirement decisions. That is, they work too long. An alternative explanation is that the relevant variable on the financial side of the retirement decision is not simply after-tax cash flow but the totality of retirement wealth and, secondarily, the cash flow that it will generate. This point is made by Burkhauser [6], who found that the present value of the entire potential stream of future wage income and retirement benefits emerges as more important theoretically and empirically than do the relative cash flows from working or retiring. By deferring retirement for one more period, the workers add to their wealth by the amount of wage income not consumed, the employer's contribution to the retirement account, and the return on retirement asset wealth. This change in wealth may dominate the effect of a simple comparison of annual cash flow from working relative to that from retirement.

Clearly, some college and university professors derive great satisfaction (that is, consumption benefits) from their work, which would be lost by retiring. Some may have limited nonwork interests and would be bored by retirement. For these groups, the relative financial incentives associated with work and retirement may be of secondary importance compared to the comparative nonmonetary aspects.

Further, many senior professors are in a particularly unique position to determine what they will be doing during the workday and, in some situations, may be able to reduce hours of work significantly without affecting compensation or job security. Given the tenured status and job flexibility inherent in the position of professor at many universities, an unofficial semiretirement (that is, a unilateral decision to reduce hours of work) may not be uncommon.

The Nature of Retirement Programming

Virtually all retirement programs are based on either "defined benefit" or "defined contribution" systems. Under the former, a worker builds up credits based on years of employment that are used in some formula to determine a benefit upon retirement. For example, a system may provide an annual retirement benefit at age 65 equal to 2 percent of average annual salary for the last three years of employment multiplied by number of years of service. For example, a worker with 30 years of service would receive a retirement benefit equal to 60 percent of average salary. Retirement prior to 65 usually results in a penalty (that is, a reduction in the benefit) due to the longer expected period of retirement. Some systems limit the maximum number of years of credit, and others provide no credit for years of service beyond age 65. Further, the payment may depend on the level of any benefits from Social Security, and some programs include a periodic adjustment to reflect changes in the cost of living.

Depending on the level of income, the combination of 60 percent replacement of wage income from a private defined-benefit system plus Social Security benefits, which might replace 40 percent or more of working income for the lower wage employee, would allow retirement with no significant decrease in income. Unless work provides significant nonmonetary rewards, the typical private retirement system provides a significant incentive to terminate employment for many workers. Further, the penalties of having to pay additional Social Security taxes and the reduction of Social Security benefits for continued employment of any kind also encourages separation from the labor force. Indeed, the experience in the United States it is that separations from the labor force increase significantly for workers around age 65 [5]. Historically, this is partly explained by the use of a mandatory retirement age for many workers (now generally illegal), but the widespread use of generous retirement benefit programs is another important factor.

Under a defined contribution plan, the employer and/or the employee make periodic payments, usually specified as a percentage of wages, into a retirement fund for the employee. The fund is invested in various kinds of assets (for example, common stock, bonds, and other assets such as mortgages, money market instruments, and so on). Often, the employee has some control over the mix of investments that allows the creation of a portfolio consistent with the workers preferences for risk and expected return. The individual builds up a stock of assets that can be converted into retirement income at any time subject to plan provisions and tax regulations.

For some, these plans become more than just retirement programs; they can substitute for life insurance and may be part of a more comprehensive wealth-creation strategy. The ability to defer federal and state taxes on both the periodic contribution and the return on fund assets is a powerful wealth-building technique, especially for those with higher incomes who have additional discretionary income to set aside in supplementary retirement programs and who face high marginal tax rates on nonsheltered income. Many institutions now offer supplemental retirement programs (for example, Supplemental Retirement Annuities) that allow employees to contribute up to $9,500 per year under current tax laws with both the annual contribution and returns on the fund tax deferred until retirement.

In general, the benefits paid under a "defined-benefit" system will be more predictable (that is, less risky), but the defined contribution alternative typically offers more flexibility and potentially greater returns, retirement benefits, and wealth. Generally, there are no formula-type limits on the amounts accrued nor on the periodic retirement benefit under the defined contribution plan.

Essentially, under a defined-contribution program, a worker accumulates a fund determined by his initial wage (Y_0), the contribution rate (c), the real growth rate of the wage (g), the rate of return on assets in the fund (r), and the length of time spent working and contributing to the fund (t).[8] Conceptually, at any period t, the individual evaluates the size of the fund, computes the periodic retirement benefit,[9] compares that to net income from working, evaluates the relative utility of work and leisure, and makes a decision about continuing to work or to retire.

Consider a young person who joins a university faculty at age 27 with an income of $40,000 per year, a real earnings growth rate of 2 percent per year, a real rate of return of 5 percent, a contribution rate of 14 percent of wages. At age 65 (after 38 years of work), the retirement fund would be in excess of $1 million.[10] Given a life expectancy of approximately 20 years at age 65, this fund would generate a real annual payment of $84,138, assuming the fund continued to return 5 percent per year.[11] Note that by increasing at 2 percent per year, real earnings at age 65 would reach $84,892 per year, which is approximately the same as the annual retirement benefit at that age. In fact, the relevant comparison is between the retirement payment and earnings after subtracting the individual's retirement contributions (including Social Security taxes) and the miscellaneous expenses associated with work. At the current Social Security tax rate of 7.65 percent and assuming the taxable wage base had increased, wage earnings in this example would be reduced by $6,494 for Social Security taxes alone. Further, by retiring this worker would also receive Social Security benefits. Given an approximate earnings replacement ratio of 34 percent, this would add another $28,863 to retirement income.

Clearly, this worker has a large incentive to retire. By working, gross income net of the Social Security tax is $78,028 less any required contribution to his retirement program. By retiring, annual income will be $113,001 including $84,138 in benefits from the private retirement program and $28,863 in Social Security benefits. Further, under current tax law, part of the Social Security benefits will not be subject to income tax.

However, there is another consideration related to total wealth. By retiring now, the retirement benefit and the real Social Security payment essentially will be fixed whereas, by delaying retirement, wealth in the fund will continue to increase geometrically, as will any future retirement benefit, and the Social Security benefit will be greater, at least to age 70. Thus, wealth can be increased significantly by delaying retirement. However, given the parameters in the example, which are reasonable in light of current conditions and historic experience, retirement income will exceed net working income well before age 65.

Retirement Wealth and Income

In this section the income and retirement wealth position of a typical university faculty member who enters the profession now is projected under alternative assumptions about the contribution rate and the rate of return on assets in the fund. These case studies illustrate the impressive size of retirement funds even under the most conservative assumptions, the relationship between retirement income and net working income, and the resultant incentives provided to retire. The parameters underlying these calculations include: initial salary, salary growth rate, rates of return on assets, contribution rates, life expectancy, and the replacement rate for Social Security. Each of these it is discussed in the following sections. Note that all projections are in real (inflation-adjusted) terms, so that all dollar amounts are comparable.

Initial Salary and Salary Growth Rates.

The average salary by rank for the 1992 academic year was as follows [13]:

Assistant professor (new)	$38,919
Assistant professor	40,458
Associate professor	46,508
Professor	64,356

Assuming six years in rank at both the assistant and associate professor levels, an entry age of 27, and retirement age of 65, the average salary as an associate professor would be achieved in 9 years, implying a real salary increase of 2 percent per year. It would then take 16 years from the average salary of an associate professor to that for a professor, implying a real salary increase of 2.05 percent per year.

In addition, the entire salary structure has been moving up over time. Based on data published by the American Association of University Professors [1] for the period 1971–93, real average salary increased 0.47 percent per year for professors and 0.77 percent per year for all faculty. From 1981 to 1993, the annual rates of increase were 2.55 percent and 2.44 percent for professors and all faculty, respectively.

In the projections developed below, it is assumed that future real salary growth across all ranks will be 1.5 percent per year. Therefore, for years 1 to 25, the annual salary growth parameter is 3.5 percent, reflecting 2.0 percent per year for promotion to the average salary in each rank and 1.5 percent general increase, and then 1.5 percent per year after year 25. Thus, a 27-year old person who joins a university faculty now at an annual salary of $40,500 is projected to have a gross salary of $100,083 by age 55 and $116,151 at age 65. To determine net working income at any age, the Social Security tax and the individual s retirement contribution are subtracted. At age 65, net working income is $106,063 for a professor whose individual retirement contribution is 4 percent.

Rate of Return on Fund Assets

Table 2 shows real rates of return on the CREF, TIAA, and the TIAA Money Market accounts from 1953 to 1993. These reflect typical rates of return on common stock, fixed income, and money market investments over this period and have applied to retirement assets actually held by the majority of faculty members in the United States. Clearly, common stock was the place for investment funds for this period; in only one of the ten comparison periods (that is, the 10 years from 1973 to 1983) did TIAA outperform CREF. Over the 40-year period, the average real return to CREF (6.5 percent) was almost five times that on TIAA (1.4 percent). It seems unlikely that real rates on fixed income investments in the future will be this low; indeed, from 1983 to 1993, the annual real return was 6.9 percent.

TABLE 2

Average Annual Real Rate of Return on TIAA, CREF, and Money Market Assets for Selected Periods, 1953-1993

Beginning Year January 1	10 Years %	20 Years %	30 Years %	40 Years %
A. CREF				
1953	11.5	8.7	4.6	6.5
1963	5.9	1.2	4.8	—
1973	−3.5	4.2	—	—
1983	12.1	—	—	—
B. TIAA				
1953	1.8	1.3	0.6	1.4
1963	0.8	1.0	1.9	—
1973	−0.3	2.7	—	—
1983	6.9	—	—	—
C. Money Market (hypothetical)				
1953	1.1	1.2	1.2	1.8
1963	1.4	1.2	2.1	—
1973	1.2	2.4	—	—
1983	3.7	—	—	—

SOURCE: Teachers' Insurance and Annuity Association [16].

In any event, the computations to follow assume, alternatively, a real rate of return on fund assets of 4.0, 5.5, and 7.0 percent during the period of accumulation. These can be interpreted as reflecting alternative levels of returns in the future and/or different asset holdings that have differential rates of return.

Contribution Rate

The distribution for contribution rates based on our recent survey of colleges and universities has been discussed. In the examples that follow total contribution rates ranging from 12 to 20 percent are used, and it is assumed that the employer contributes 2 percent for every 1 percent contributed by the employee.

Life Expectancy

To simplify computations, a life expectancy to age 85 is used in all of the calculations. This is the typical age used by major annuity providers in computing benefits for someone retiring at age 65. No adjustments are made to account for different end-of-life expectancies at other ages.

Social Security Benefits

Benefits under the Social Security program are difficult to project both because of the cumbersome benefit formula and the potential for changes in the rules relating to benefits. Based on current rules and the income level used in the examples, a replacement rate for final year income of 34 percent is used. It is assumed that full benefits are payable at age 65, although the minimum age for receipt of a full benefit will begin to increase beginning in 2004. Benefits are reduced for retirement prior to age 65 and increased for retirement after that age.

Based on these parameters, a projection is made of salary, retirement fund balances (assuming annual compounding of returns), and potential retirement income at age 55, 60, 65, and 70 for alternative contribution rates of 12, 16, and 20 percent and alternative real rates of return of 4.0, 5.5, and 7.0 percent. The fund balance for each alternative is shown in table 3. Note that even under the most conservative alternative (that is, a 12 percent contribution rate and 4 percent rate of return), the amounts are substantial. For example, at age 60, the balance is $524,108 and rises to $711,108 at age 65. For the most liberal assumptions (that is, a 20 percent contribution rate and 7.0 percent rate of return), the fund balances are staggering, exceeding $2 million at 65 and $3.2 million at age 70. Even in the intermediate case, the balance exceeds $1,000,000 at age 62. Recall that all these data are reported in real (inflation-adjusted) terms.

Obviously, funds of this magnitude give rise to substantial retirement benefits as shown in table 4. It is assumed that at retirement the entire fund would be conservatively invested in an annuity earning a real rate of 4.0 percent per annum and that the payment is based on single-life

TABLE 3

Value of a Retirement Fund at Specific Ages for Alternative Contribution Rates and Alternative Rates of Return

Contribution Rate			Retirement Fund Based on Annual Rate of Return of:		
Employee	Employer	Age	4.0%	5.5%	7.0%
4.0%	8.0%	55	$ 374,567	$ 463,095	$ 578,247
		60	524,010	676,103	804,533
		65	711,108	959,973	1,319,798
		70	944,427	1,336,878	1,936,399
5.3	10.7	55	499,423	617,460	770,996
		60	698,680	901,471	1,179,378
		65	949,144	1,279,964	1,759,730
		70	1,259,236	1,782,504	2,581,866
6.7	13.3	55	624,279	771,825	963,744
		60	873,350	1,126,839	1,475,222
		65	1,185,180	1,599,955	2,199,663
		70	1,574,086	2,228,130	3,227,332

TABLE 4

Net Working Income and Retirement Income at Specified Ages, and "Breakeven" Age for Alternative Employer Contribution Rates and Rates on Return on the Retirement Fund

Contribution Rate			Annual Net Working Income*	Annual Retirement Income† and Percentage of Income Replaced Based on Rate of Return of:					
Employee	Employer	Age		4.0%		5.5%		7.0%	
%	%		$	$	%	$	%	$	%
4.0	8.0	55	90,872	21,661	(23.8)‡	26,781	(29.5)	33,440	(36.8)
		60	98,185	33,543	(34.2)	43,279	(44.1)	56,621	(57.7)
		65	106,063	66,095	(62.3)	84,406	(79.6)	110,883	(104.5)
		70	114,551	88,771	(77.5)	117,648	(102.7)	161,762	(141.2)
"Breakeven" Age					§		69.6		65.5
5.3	10.7	55	89,571	28,882	(32.2)	35,708	(39.9)	$44,587	(49.8)
		60	96,783	44,724	(46.2)	57,705	(59.6)	75,494	(78.0)
		65	104,553	83,536	(79.9)	107,952	(103.3)	143,254	(137.0)
		70	112,924	111,935	(99.1)	150,438	(133.2)	209,256	(185.3)
"Breakeven" Age					*		64.7		61.8
6.7	13.3	55	88,169	36,102	(40.9)	44,635	(50.6)	55,733	(63.2)
		60	95,274	55,905	(58.7)	72,131	(75.7)	94,368	(99.3)
		65	102,927	100,978	(98.1)	131,497	(127.8)	175,625	(170.6)
		70	111,172	135,099	(121.5)	183,228	(164.8)	256,751	(230.9)
"Breakeven" Age					65.0		61.9		60.1

*Working income less Social Security taxes and the individual's share of the contribution to the retirement fund.

†Including Social Security benefits.

‡Percentage of working income replaced.

§Indicates that "breakeven" did not occur by age 70.

to age 85. In addition, potential Social Security benefits are included beginning at age 62. In the intermediate case, the annual benefit at age 65 is $107,952, which is 103.3 percent of net working income (that is, gross salary less contributions for Social Security and the retirement program) for that year. At age 64.7, retirement income would equal net working income. In the most liberal case, retirement income will exceed net working income at age 60.1.

Should the individual be making additional contributions to a supplemental program, the "breakdown" will occur even earlier as (1) retirement wealth will accumulate more rapidly and (2) net working income will be reduced by the amount of the supplemental contributions.

The time paths of networking income and potential retirement income for each rate-of-return-alternative, assuming a 16 percent contribution, are shown in figure 1. Note the following: (1) the time-path of retirement income is discontinuous at age 62, when Social Security income begins; (2) the break-even age depends significantly on the rate of return assumption; (3) the potential retirement income increases dra-

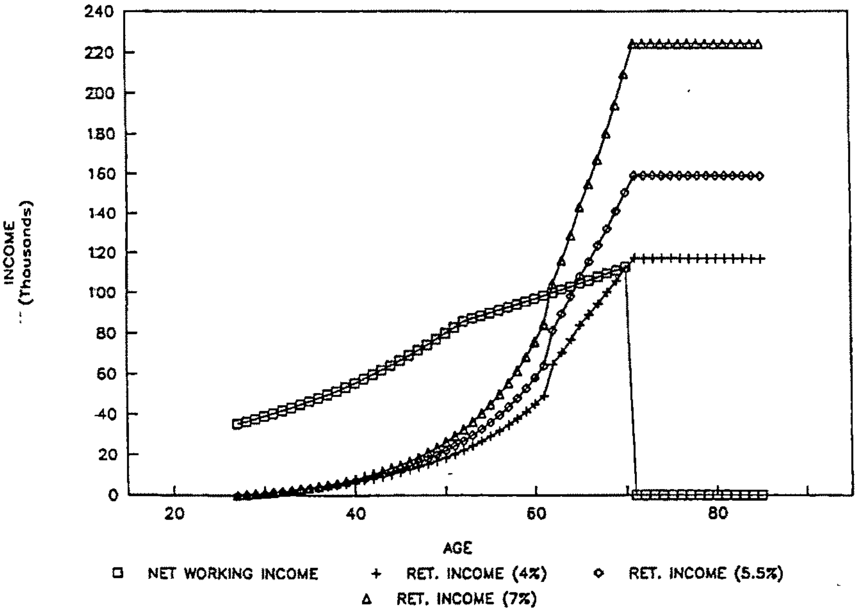

FIG. 1. Comparison of Net Working Income and Potential Retirement Benefits

matically with each year that retirement is delayed, especially beyond age 60; and (4) a relatively small difference in the rate of return on the retirement fund makes a huge difference in potential income at retirement age. For example, at age 65, income based on a 16 percent contribution rate and a 7.0 percent return is $143,254 per year compared to $107,952, when the return is 5.5 percent and $83,536 for the 4.0 percent alternative.

Of course, the decision to retire will fix the level of income, whereas by continuing to work, salary will increase and future retirement benefits will be higher because of additional contributions and returns to the fund and a shorter life expectancy when the benefits are finally taken. Thus, wealth will continue to grow by continuing to work. This notwithstanding, the time will come for many faculty members when retirement income for the next year will exceed net working income. The ability to quit working and immediately have an increase in net income should offer a reasonably strong incentive to retire.

Early Retirement Incentives

As just shown, the basic retirement program at the "average" university provides a sufficient level of income for the long-term employee that retirement should be feasible at age 65 if not earlier. For example, at age 65 the lowest ratio of retirement benefit to net working income is 0.623, and for the intermediate scenario the ratio is 1.033.[12]

If the incentive to retire was not already sufficient, about 44 percent of colleges and universities currently offer additional incentives to retire prior to age 65. Some institutions with defined benefit plans offer to augment age and/or years of service in the benefit formula as a means of increasing benefits and, in some cases, waive the reduction in benefits associated with retirement prior to age 65. Others offer various kinds of lump-sum payments ranging from 25 to 125 percent of salary, with the larger amounts usually paid over several years. Based on the survey data, the average lump-sum payment under an early retirement program was 63 percent of one year's salary. In most cases, the payment was in a true lump-sum, but at several institutions the payments were spread over several years. The plan at Utah State University that offers 20 percent of salary per year to age 65 to eligible employees between ages 59 and 64 has been described.[13] At age 59, this amounts to a payment of 1.2 years of salary (ignoring discounting to present value).

Special Characteristics of Retirement Fund Wealth

As demonstrated in the data just presented, the use of tax-sheltered retirement saving is a powerful method of accumulating wealth. However, that "wealth" has a set of unique characteristics that may make it less valuable than other forms of wealth. Assets in tax-sheltered retirement accounts are illiquid; generally, an employee has to retire or at least leave his current employer in order to receive benefits or be "cashed out." Further, fund balances cannot be given away nor used as collateral for loans, although some plans do allow borrowing. Withdrawals made prior to age 59½ are subject to regular income tax rates plus a penalty of 10 percent of the amount withdrawn. Generally, payouts have to begin by age 70½, or a tax is levied on the difference between what was actually drawn and the minimum that should have been paid out according to IRS regulations. Finally, the excess of any payment over $150,000 per year from a tax-sheltered retirement account is subject to a 15 percent surtax.

Federal estate and state death taxes also must be considered. Upon death, ownership of a tax-sheltered fund may pass to a surviving spouse free of estate and death taxes, and income taxes are due only as funds are withdrawn. But this is not the case for nonspousal beneficiaries, such as children. In the latter case the full value of retirement funds will be subject first to estate taxes and then to income taxes. Each nonspousal beneficiary will have to pay income taxes on distributions from the remaining fund balance, although special 5-year averaging provisions can be used to reduce the tax impact. To the extent that the value of the estate is in excess of $600,000, a federal estate tax of at least 37 percent also will be levied, although part of the estate tax is deductible in computing taxable income.

These special characteristics do not mean that the use of tax-sheltered retirement saving is not a good financial strategy but only that the illiquidity, ownership questions, and tax consequences at both ends of the life cycle should be considered. The point is that wealth accumulated in such accounts has much different characteristics than does wealth amassed in personal ownership not subject to the regulation and tax liabilities associated with retirement assets.

Summary

The typical college or university in the United States provides a retirement program that when combined with Social Security can be expected to provide a level of income at age 65 that is comparable to the individual's current net working income. Although this should provide a significant incentive to retire, for an individual who is seeking to maximize wealth and/or who still receives substantial satisfaction from continuing to work it may not be a sufficient incentive. With both the value of the retirement fund and potential retirement income increasing exponentially with time, the defined contribution program provides strong incentives for continuing to work. Thus, institutions which seek to encourage retirement at the traditional age of 65 (or earlier) should consider the adoption of additional incentives to retire.

About one-half of the colleges and universities surveyed either have or have had programs designed to encourage retirement before age 65. It may be that such programs will have to be liberalized to encourage retirement at or even after age 65. For example, the University of Chicago has adopted an incentive program that provides for payment equal to two years of salary at age 65 to a retiring faculty member. The payment declines by 20 percent each year that retirement is delayed, reaching zero by age 70. This program provides a strong incentive to retire at 65, although it may not be efficient if many who receive the payment would have retired anyway.

The combination of the elimination of a mandatory retirement age and a wealth-creating retirement program may slow the flow of older faculty members from our colleges and universities. The time may be ripe for expanded use of additional incentives at targeted ages and for the developments of new designs to encourage retirement.

Notes

[1] College enrollment increased from 2.3 million in 1960 to more than 7.2 million in 1975. During the 1980s enrollment was relatively flat, but it has begun to increase again in the 1990s. The number of instructional staff in institutions of higher education increased from 425,000 in 1960 to 474,000 in 1970 and 686,000 in 1980. The current level is in excess of 800,000 [19].

[2] Production of Ph.D. degrees tripled in the 1960s to a level of about 30,000 per year by 1970 and remained at a fairly constant level of 32,000–34,000 per year through 1988 [19].

[3] Under the typical "defined contribution" program, usually both the employer and the employee contribute a specified percentage of salary to a fund that is vested with and subject to some management control by the employee. Wealth usually continues to increase as long as work continues and the rate of return on fund assets is positive. At retirement the wealth accumulation period ends, and the assets are used to generate retirement income. In the event of death, accumulated assets are distributed to a beneficiary. The TIAA/CREF program used at many colleges and universities is a conventional "defined contribution" plan. Under a "defined benefit" program a formula is used to determine the retirement benefit, which generally depends on age, years of service, and recent salary levels. Many state retirement plans fall in this category. In some defined-benefit programs, there is a limit on the percentage of income replaced (for example, 70 percent of average income for the past three years), whereas there is no conceptual limit on the income generated under a defined contribution plan. Thus, the two types of plans can have different incentives to retire.

[4] Certainly those who participate in the TIAA/CREF program receive enough periodic reports, performance evaluations, and offers to participate in supplemental programs that it is difficult not to be current on these matters.

[5] Each sample was different and each included a major public university and a smaller private institution in each of the fifty states. The data are offered as indicative of the array of retirement programs being offered in higher education.

[6] This program also provides payment of medical and dental insurance premiums and retirement plan contributions; in addition, allowance is made for the employee to work up to 50 percent time for the university on an "as-needed" basis.

[7] Soldofsky offers a cynical possibility that administrators may not want faculty members to retire, so they intentionally provide counseling that is intended to discourage retirement by understating potential retirement benefits. Presumably, these faculty members are so productive that their retirement would result in significant losses in value of research and teaching outputs (over and above their salary costs) that would be difficult to replace.

[8] The value of fund (F_t) at time t is given by $F_t = \left(\frac{c}{g+r}\right) Y_0 [e^{(g+r)t} - 1]$.

[9] The periodic retirement payment (P_t) is found by setting the value of the fund equal to the present value of all future payments over the length of the retirement period, for example, $F_t = \int_0^{t_0 - t} P_t e^{-rt}\,dt$, evaluating the integral, and solving for P_t which yields,

$$P_t = \frac{rF_t}{[1 - e^{-r(t_0 - t)}]}$$

[10] The computation is $F_{37} = [0.14/0.07]\ 40{,}000\ [e^{0.07(38)} - 1] = \$1{,}063{,}703$.

[11] The payment is computed as $P_t = \dfrac{(0.05)\ \$1{,}063{,}703}{[1 - e^{-0.05(20)}]} = \$84{,}138$.

[12] Even this understates the true replacement ratio because part of the Social Security benefit currently it is not subject to income taxes, and employment-related expenses

such as commuting costs would be eliminated by retiring, thus making the effective replacement ratio even higher.

[13] To be eligible an employee must be at least 59 years of age and "age plus years of service" must equal 75. The minimum age had been 55, but apparently there was some violation of federal age discrimination rules and the minimum age was increased to 59. Almost predictably, nobody was made better off by that mandated change, but a number of people in the 55-58 age category were made worse off. One year, at the peak of a budget crisis, the plan was liberalized by offering 30 percent of salary for six years with a minimum age of 50 and a minimum age plus years of service of 70. The number of retirees was more than double the usual number; many actually did not retire but took the incentive and found another job.

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JE Latika Vasil

Social Process Skills and Career Achievement among Male and Female Academics

Research examining women's career development in academia suggests that despite the introduction of equal opportunity policies women continue to be underrepresented in the profession, particularly in the higher ranks. In New Zealand universities women comprised 22 percent of full-time academic staff in 1991. Patterns by academic rank show women to be concentrated in the lower ranks. In 1991 women represented only 4 percent of professors and 7 percent of associate professors. However, 49 percent of all assistant lecturers were women [12].

Psychologically based explanations for this situation have focused on a range of individual and environmental factors. Finkelstein [6] identified two explanations for the lower status of women academics. The first explanation suggests that female academics are disadvantaged due to structural factors such as overt discrimination. The second explanation for the status of women in the academic profession focuses on gender differences in performance, for example, female academics' lower publication rates [9, 13] and lower teaching evaluations [11, 16]. Differences in performance have been attributed to various sources including women's differing values, orientations, and activity preferences; greater role conflict and overload among female academics; and differences in educational background and training, such as lack of mentoring [6, 17].

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Several studies have investigated the contribution of self-efficacy beliefs to explaining gender differences in the academic career [10, 15, 19, 20]. Self-efficacy beliefs [3, 4] are people's perceptions of confidence in their ability to perform successfully a given behavior and are derived and shaped by social experience. Whether a task is attempted, how much effort is expended, and persistence in performance are influenced by self-efficacy beliefs. The inclusion of self-efficacy as an important explanatory variable in models of career choice and development was first proposed by Hackett and Betz [7]. Their application of self-efficacy to the career domain focused in particular on how self-efficacy perceptions develop differently in males and females due to differing socialization experiences. Self-efficacy theory was considered relevant to understanding women's career development because weak self-efficacy perceptions can be viewed as internal barriers to women's career choices and advancement, whereas strong self-efficacy beliefs are necessary to overcome external barriers, such as discrimination, to women's career development.

In the context of the academic career, studies have found that female academics report being less confident for research tasks than their male counterparts [10, 15, 19]. Furthermore, a positive relationship between research self-efficacy and research productivity has been suggested [19]. The implications of such studies are that female academics may be disadvantaged in their career advancement due to their lower research self-efficacy beliefs and productivity, given that excellence in research is a major consideration in the academic reward structure.

In order to extend the empirical investigation of the application of self-efficacy theory to women's career development in the academic profession it is necessary to examine additional behavioral domains relevant to the academic career. To date the focus has been on the specific content skills necessary to the job, such as teaching, research, and administrative duties. The concept of academic self-efficacy could be broadened in scope to incorporate important professional competencies of a more general nature, such as political, communication, and interpersonal skills. An investigation of self-efficacy in relationship to these "social process" skills [10] may provide further insight into gender differences in the academic career. Hackett, Betz and Doty [8] developed a taxonomy of important career competencies for professional, specifically academic, women.

The purpose of the present study was to examine gender differences in self-efficacy beliefs for the social process skills important to an academic career. The study also attempted to determine the extent to which social process self-efficacy is related to career achievement among university academic staff, thus testing the utility of the concept of social process self-efficacy for explaining gender differences in male and female achievement in the academic career. Academic achievement was operationalized as research productivity given its critical role in the academic reward structure. This is not to suggest, however, that other indices of achievement in the academic career (for example, teaching and administrative performance) are not important.

Method

Subjects

The sample comprised 655 full-time academic staff randomly selected from staff lists from the six major universities in New Zealand. A disproportionate stratified random sample with equal proportions of males and females was drawn due to the emphasis on possible gender differences among academic staff.

A response rate of 66 percent was achieved with statistical analysis based on 397 responses (199 male and 200 female). The average age of respondents was 42.8 (45 for males and 41 for females). Seven percent of respondents were professors, 10 percent associate professors, 37 percent senior lecturers, 39 percent lecturers, and 7 percent below the rank of lecturer. Respondents were represented in the following academic fields: commerce (17 percent), humanities (26 percent), social sciences (23 percent), physical sciences (8 percent), biological sciences (11 percent), engineering (6 percent), and mathematics/computer sciences (9 percent). See tables 1 and 2 for a breakdown of academic rank and academic field by gender. On average, respondents had 12 years of experience as university academic staff (15 for males and 9 for females).

TABLE 1
Academic Rank by Gender

	Males		Females		Total	
Rank	*n*	%	*n*	%	*n*	%
Professor	24	12.1	2	1.0	26	6.6
Assoc. Professor/Reader	31	15.6	9	4.6	40	10.1
Senior Lecturer	87	43.7	60	30.3	147	37.0
Lecturer	49	24.6	107	54.0	156	39.3
Other	8	4.0	20	10.1	28	7.0

TABLE 2
Academic Field by Gender

	Males		Females		Total	
Academic Field	*n*	%	*n*	%	*n*	%
Commerce	34	17.1	34	17.0	68	17.0
Humanities	38	19.0	66	33.0	104	26.1
Social sciences	33	16.6	59	29.5	92	23.1
Physical sciences	20	10.1	13	6.5	33	8.3
Biological sciences	26	13.1	20	10.0	46	11.5
Engineering	22	11.0	0	0.0	22	5.5
Mathematics/computer sciences	26	13.1	8	4.0	34	8.5

Measures

A questionnaire including measures of self-efficacy beliefs, research productivity, academic rank, years of experience, academic field, and demographic information was mailed to respondents.

Social process skills self-efficacy scale. Self-efficacy beliefs for social process skills were measured using a scale consisting of 15 items derived from Hackett, Betz and Doty's [8] taxonomy of career competencies for professional, specifically academic, women. Items covered areas of competency such as communication skills (for example, speaking effectively in groups), organisational skills (for example, chairing academic meetings), political skills (for example, negotiating/applying for promotions), interpersonal skills (for example, communicating with colleagues), management skills (for example, managing time effectively), and self-promotion skills (for example, getting work recognised). A small sample of academic staff were shown the scale to check that items were clear and the scale sufficiently comprehensive. As a measure of strength of self-efficacy beliefs respondents were asked to indicate their confidence in performing each of the items on a 10-point scale ranging from complete confidence (9) to no confidence at all (0). The internal consistency of the scale was evaluated using Cronbach's alpha yielding a reliability estimate of 0.93 on the present sample.

A factor analysis was conducted on the sample data to examine the factor structure of the scale (see table 3). A principal components analysis yielded three factors with an eigenvalue greater than one (7.79, 1.72 and 1.10). These three factors accounted for 52 percent, 12 percent, and 7 percent of the variance and reflected general confidence, group participation skills, and self-promotion skills, respectively. These percentages represent the relative importance of the three factors. The first factor had large positive loadings for all 15 items, indicating that, in general, high scores tended to be associated with other high scores

TABLE 3

Factor Matrix of Social Process Self-Efficacy Scale

Item	Factor Loadings		
	Factor 1	Factor 2	Factor 3
Speaking effectively in groups	0.69	−0.58	−0.08
Participating in groups	0.68	−0.58	−0.23
Assuming leadership roles in groups	0.76	−0.54	−0.07
Chairing academic meetings	0.72	−0.43	0.14
Developing strategies to promote oneself	0.81	−0.05	0.35
Getting work recognised	0.77	0.10	0.45
Negotiating/applying for promotions	0.78	0.12	0.44
Evaluating a colleague for promotion	0.65	0.21	0.28
Communicating with colleagues	0.71	0.04	−0.29
Expressing dissatisfaction/criticism at work	0.75	0.29	−0.32
Expressing views and opinions at work	0.75	0.24	−0.35
Handling criticism from others	0.66	0.34	−0.07
Managing time effectively	0.55	0.26	0.15
Being assertive when necessary	0.76	0.25	−0.21
Objecting to discrimination or poor treatment	0.73	0.34	−0.22

NOTE: Variable weightings for males and females were used to adjust the estimated correlation matrix (used for the factor analysis) for the disproportionate stratified sampling procedure.

(that is, if an individual scored high on one item, this individual would score high on other items). The second factor consisted of "speaking effectively in groups," "participating in groups," "assuming leadership roles in groups," and "chairing academic meetings," distinguishing an emphasis on working in groups. The third factor linked in a moderate way self-promotion qualities, for example, "developing strategies to promote oneself," "getting work recognised," and "negotiating/applying for promotions."

Research Productivity. A productivity index based on Thoreson, Kardash, Leuthold, and Morrow [18] was computed by asking respondents to report the number of conference presentations they had made; reports, refereed articles, book chapters, and books they had published; research grants they had received; and graduate students they had supervised who graduated, during the past three years. The seven measures were then weighted as follows: the number of presentations and reports each counted as one, the number of articles and book chapters were each multiplied by three, the number of books was multiplied by nine, and the number of research grants and masters/doctoral students who graduated were each multiplied by two. The productivity index was calculated by adding the weighted scores.

Demographic and career information. Respondents were asked to provide the following information: gender, age, marital and caregiver status, years of experience as academic staff, academic rank, and academic field.

Results

Gender Differences in Self-Efficacy for Social Process Skills

Male academics reported significantly stronger self-efficacy beliefs for social process skills than their female counterparts (male $M = 95.64$, $SD = 20.17$; female $M = 89.80$, $SD = 21.22$; $t = 2.63, p < 0.05$). Mean scores for male and female academics on the individual items comprising the social process self-efficacy scale are shown in table 4. Males reported significantly stronger self-efficacy beliefs for 5 of the 15 items (chairing academic meetings, developing strategies to promote oneself, getting work recognised, negotiating/applying for promotions, and evaluating a colleague for promotion), indicating greater confidence for these tasks.

TABLE 4
Means and Standard Deviations for Social Process Self-Efficacy Items by Gender

	Males ($n = 199$)		Females ($n = 200$)		
	M	*SD*	*M*	*SD*	*t*
Speaking effectively in groups	7.0	1.4	6.8	1.7	1.4
Participating in groups	7.1	1.5	7.0	1.6	0.2
Assuming leadership roles in groups	6.7	1.8	6.6	1.8	0.8
Chairing academic meetings	6.3	2.1	5.6	2.4	3.1*
Developing strategies to promote oneself	5.3	2.2	4.8	2.2	2.0*
Getting work recognised	5.9	1.9	5.2	2.0	3.5*
Negotiating/applying for promotions	5.6	2.2	4.9	2.2	2.7*
Evaluating a colleague for promotion	6.4	1.8	5.7	2.1	3.0*
Communicating with colleagues	7.2	1.3	7.1	1.6	1.1
Expressing dissatisfaction/criticism at work	6.1	2.0	5.8	2.0	1.2
Expressing views and opinions at work	6.8	1.8	6.6	1.7	1.3
Handling criticism from others	6.0	1.8	5.7	1.9	1.6
Managing time effectively	5.9	1.9	6.1	1.9	−1.1
Being assertive when necessary	6.3	1.9	6.2	1.9	0.7
Objecting to discrimination or poor treatment	6.2	2.0	5.9	2.2	1.1

*$p < 0.05$

Table 5 compares the mean factor scores for males and females on the three factors identified in the principal components analysis of the self-efficacy scale. The purpose of this analysis was to determine if gender differences exist in the three dimensions identified in the factor analysis. Loadings on each factor for each item were used to create a

TABLE 5
Means and Standard Deviations for Social Process Self-Efficacy Scale Factors by Gender

	Males ($n = 176$)		Females ($n = 171$)		
	M	*SD*	*M*	*SD*	*t*
General Confidence Factor	68.56	14.65	64.26	15.40	2.66*
Group Participation Skills Confidence Factor	−1.22	3.07	−1.34	3.25	0.34
Self-Promotion Skills Confidence Factor	−1.65	2.13	−2.22	2.40	2.31*

$^*p < 0.05$

factor score individually for all respondents, that is, the 15 item scores for each respondent were reduced to 3 factor scores.

The results show that male academics reported stronger self-efficacy beliefs than their female counterparts on 2 of the 3 factors (the General Confidence Factor and the Self-Promotion Skills Confidence Factor).

To examine whether gender had an effect on self-efficacy beliefs after controlling for the influence of years of experience, academic rank, academic field, and institutional affiliation, a multiple regression analysis was carried out with self-efficacy as the dependent variable (see table 6). The regression equation explained a significant amount of the variance in self-efficacy ($R^2 = 0.156, p < 0.05$). An examination of the regression coefficients of the explanatory variables showed that gender failed to reach significance individually. Thus gender did not explain any unique variance in self-efficacy beliefs after adjusting for the influence of experience, rank, academic field, and institutional affiliation.

Greater experience within a particular academic rank was associated with lower self-efficacy scores, indicating that more experienced or older academics were less confident than younger colleagues of the same rank. Increases in academic rank meant significantly higher self-efficacy scores on average. Social scientists taken as a group had significantly higher self-efficacy scores than others.

The Relationship between Social Process Self-Efficacy and Research Productivity

Analysis of gender differences in research productivity on the present sample are reported in Vasil [20]. In summary it was found that male academics reported greater productivity than females (Male $M = 39.10$, $SD = 35.09$; Female $M = 25.57$, $SD = 21.21$; $t = 4.64, p < 0.05$).

To examine whether social process self-efficacy had a significant effect on research productivity over and above the effects of experience, rank, academic field, institution, and gender, a stepwise multiple regression analysis with research productivity as the dependent variable

TABLE 6

Multiple Regression of Self-Efficacy on Years of Experience, Rank, Academic Field, Institution, and Gender

	Beta	t	R^2	df
			0.156*	17,342
Experience	−0.53	−3.14*		
Rank[a]				
Professor	27.72	3.92*		
Reader	24.69	3.86*		
Senior Lecturer	14.20	2.65*		
Lecturer	9.09	1.86		
Academic Field[b]				
Commerce	6.25	1.37		
Humanities	6.62	1.52		
Social Sciences	12.75	2.92*		
Physical Sciences	−0.02	−0.00		
Biological Sciences	4.24	0.90		
Engineering	8.22	1.42		
Institution[c]				
Auckland	−9.35	−2.49*		
Waikato	−3.48	−0.83		
Massey	−3.98	−0.12		
Victoria	−14.99	−3.39*		
Canterbury	−8.43	−2.08*		
Gender	−4.76	−1.91		

NOTE: Significance of R^2 based on F test.

[a] Rank = 4 dummy variables. The rank of "other" is not represented to avoid redundancy (each dummy = 1; all others including "other" = 0).

[b] Academic Field = 6 dummy variables. The academic field of "mathematics/computer science" is not represented to avoid redundancy (each dummy = 1; all others including "mathematics/computer science" = 0).

[c] Institution = 5 dummy variables. "Otago University" is not represented to avoid redundancy (each dummy = 1; all others including "Otago University" = 0).

*$p < 0.05$

was carried out (see table 7). The regression model at step one, comprising the following predictor variables: years of experience, academic rank, academic field, institutional affiliation, and gender, explained 27 percent ($p < 0.05$) of the variance in research productivity. The addition of self-efficacy to the above regression model at step two increased the variance explained by a small but significant 2 percent ($p < 0.05$).

Discussion

Results showed significant gender differences in confidence ratings for the social process self-efficacy scale as a whole as well as 5 of the 15 individual items comprising the scale. Interestingly, male academics reported significantly stronger self-efficacy perceptions than females for self-promotion skills, including developing strategies to promote oneself, negotiating/applying for promotions, and evaluating a colleague

TABLE 7

Stepwise Regression of Research Productivity on Self-Efficacy, Years of Experience, Rank, Academic Field, Institution and Gender

	Beta	t	R^2	R^2inc	df
Step 1			0.274*		17.393
Experience	−0.89	−4.28*			
Rank[a]					
Professor	63.43	7.68*			
Reader	57.28	7.50*			
Senior Lecturer	36.34	5.80*			
Lecturer	18.53	3.34*			
Academic Field[b]					
Commerce	−3.17	−0.57			
Humanities	−2.95	−0.55			
Social Sciences	6.65	1.24			
Physical Sciences	10.61	1.66			
Biological Sciences	11.62	1.96*			
Engineering	3.65	0.49			
Institution[c]					
Auckland	7.17	1.56			
Waikato	2.48	0.49			
Massey	−3.26	−0.75			
Victoria	4.22	0.80			
Canterbury	1.49	0.30			
Gender	−5.25	−1.72			
Step 2			0.290*	0.016*	18,341
Self-Efficacy	0.012	5.71*			

NOTE: Significance of R^2 and R^2 increase based on F tests.

[a] Rank = 4-dummy variables. The rank of "other" is not represented to avoid redundancy (each dummy = 1; all others including "other" = 0).

[b] Academic Field = 6 dummy variables. The academic field of "mathematics/computer science" is not represented to avoid redundancy (each dummy = 1; all others including "mathematics/computer science" = 0).

[c] Institution = 5 dummy variables. "Otago University" is not represented to avoid redundancy (each dummy = 1; all others including "Otago University" = 0).

*$p < 0.05$

for promotion. No differences emerged with respect to communication skills, such as speaking effectively in groups and assuming leadership roles in groups, with males and females expressing similar levels of confidence in this area.

These findings would suggest that female academics feel least confident in situations that involve dealing with the politics of the academic career or more colloquially, "playing the system." This finding is primarily a reflection of female academics' lower positioning in the academic hierarchy and thus relative lack of power in terms of determining and shaping the "rules of the game." For example, because males occupy the majority of senior positions, appraisal and promotion processes are largely implemented by men. Research suggests that such processes may not be suitable for female academics because their perceptions of the job may be at variance with those of their male evaluators [2]. Similarly, female academics, given their concentration in the lower ranks, may not be as knowledgeable as more senior males in how the system works and how best to negotiate it. Lack of mentoring may also play a role in this dynamic. Further study using in-depth interview methodology may help to tease out the influence of these various contextual factors on women academics' professional experiences and development. Results of a regression analysis suggest that there are no gender differences in self-efficacy for social process skills when the effects of experience, academic rank, academic field, and institution are controlled for. Therefore it would appear that women academics' lack of seniority is a critical factor in observed gender differences.

The results of this study found that confidence for social process skills explained a small but significant amount of unique variance in a measure of career achievement (that is, research productivity). The weak relationship may simply reflect the fact that social process skills are only tangentially or indirectly related to research performance. Previous studies found that confidence for research tasks were strongly positively related to research productivity [for example, 19]. Thus it would appear that content skills, more so than process skills, have a greater impact on this particular indicator of career achievement in academia. Further study examining the relationship between social process self-efficacy and other measures of career achievement, such as successful applications for promotion, would be useful.

In the present study emphasis was placed on examining the influence of self-efficacy beliefs on research productivity. However, it is important to note the reciprocal relationship between these two variables. Bandura [3, 4] stresses that one of the most important sources of information shaping an individual's self-efficacy beliefs are successful experiences. Thus, low levels of research productivity would, according to self-efficacy theory, further diminish perceptions of self-efficacy.

Although the focus of the present study has been on individuals' perceptions of competency, it is necessary to recognise the importance of contextual factors that contribute to shaping individuals' career development in academia. For example, institutional factors, such as gender discrimination and the androcentric nature of university policies and practices, have been identified as powerful external barriers to female academics' advancement and retention in the profession [2, 5, 14]. It is important to note that perceptions of self-efficacy do not develop in a social vacuum but rather are shaped and modified by experience. The concept of self-efficacy is a useful one in attempting to understand how contextual factors, such as barriers to success, are managed.

It is also important to note that, broadly speaking, much of the research on the position of women academics, including the present study, can be located within the paradigm of liberal feminism, with its emphasis on equality of access and opportunity for women within existing social hierarchies. Such an approach to the problem of equity for women in higher education has been criticized [for example, 1]. Critiques center on the approach being too simplistic, in that it ignores or understates the impact of structural explanations for observed patterns, places the onus for change on individuals rather than challenging the nature of various institutional practices, and fails to address issues of class and ethnicity in analyses of gender inequity.

The present study, though loosely falling within the parameters of a liberal feminist approach, is not intended to profer a definitive individual-centered explanation for women's position in academia, but rather it is meant to explore one piece of the complex puzzle while at the same time acknowledging that individuals are located within social contexts. Further research is needed beyond documenting patterns of disadvantage among academic women and the development of these patterns through socialization processes. As Acker [1] notes, analysis of *why* disadvantage occurs also needs to be addressed.

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Book Reviews

Research Ethics: Cases and Materials, edited by
Robin Levin Penslar. Bloomington: Indiana University
Press, 1995. xvi 278 pp. $29.95 ($12.95)

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Scientific misconduct has been the topic of considerable attention by the lay public, the research community, and scholars of the process of professional self-regulation. This interest is fueled by the growing public perception that scientific wrongdoing is not a rare event [1], a perception that is not without some support, given that an estimated 20 percent of scientists have directly experienced fraud [4]. Professional self-regulation involves not only the sanctioning of wrongdoing, but also the deterrence and detection of it. The graduate school socialization process is posited to be of fundamental importance to the deterrence and detection of research malfeasance, as ethical principles of doing research and scholarship are inculcated through this process [2, 5]. Accordingly, the National Science Foundation and the National Institutes of Health have been actively urging that educational efforts attending to the proper conduct of research be implemented in colleges and universities.

Research Ethics: Cases and Materials was developed to assist in such efforts. As the editor of this volume states, its purpose is to serve as a resource for college and university faculty who teach undergraduate and graduate level courses or parts of courses that address the proper conduct of research and scholarship. This purpose is accomplished through case studies of various research improprieties in biology, psychology, and history. The case studies were developed by participants from these three disciplines in a FIPSE funded project entitled "Catalyst," which was conducted by the Poynter Center at Indiana University.

Nineteen of the twenty-one chapters of this edited work are organized around case studies. The other two chapters comprise a section labeled "Theory and Pedagogy." These two chapters, placed at the beginning of the book, serve as a framework for the various case studies. The first chapter, "General Issues in Teaching Research Ethics," by Kenneth D. Pimple, identifies issues that should be discussed when teaching research ethics. The notion that moral sensitivity and moral reasoning are to be stressed in the teaching of research ethics through the use of case studies is also an important aspect of this chapter. In the second chapter, entitled "Introduction to Ethical Theory," by Lucinda Peach, approaches to four types of ethical theories are presented: Consequentialist Ethics, Deontoligical Ethics, Casuistical Ethics, and Virtue Ethics. Consequentialists hold that an act constitutes misconduct if harm results from the action. In contrast, the Deontological approach hinges on whether an act violates a moral rule. In the casuistry approach the focal case is compared to other similar cases to determine whether it is more problematic than the cases of comparison. When the theory of Virtue Ethics is applied, the character of the offending individual is the focus of analysis. The frequency of occurrences of acts of wrongdoing are also considered. Peach suggests that these approaches can be used alone or in combination with others to conduct an ethical analysis of the various case studies presented in this book.

The remaining nineteen case study chapters are divided into three sections: "Cases in the Natural Sciences: Biology," "Cases in the Behavioral Sciences: Psychology," and "Cases in the Humanities: History." The case studies developed for the natural sciences comprise the contents of six chapters. The ethical issues covered in these chapters include: the definition and identification of scientific misconduct; how investigations of misconduct are and should be conducted; the correction of published results; reaction to alleged incidents of fraud; intellectual property rights; the relationship between mentors and their graduate and postdoctoral students; proper laboratory practices; the alteration of data; and the attribution of authorship by students. Additional topics that have been addressed through case studies include the ethics of genetic screening and testing and the application of family genetic history (pedigree analysis) to determine whether eugenics is appropriate.

Seven chapters concentrate on case studies pertinent to ethical issues in the behavioral sciences. In these chapters authors discuss the use of laboratory animals in behavioral science research; the role of institutional review boards in calculating the costs and benefits of conducting research using human subjects; the giving of alcohol to human subjects in research; the types of deception occurring in research; day-to-day improprieties in behavioral research; obtaining informed consent without coercion or the influence of power over the subject; and behavior modification.

Ethical issues relevant to the humanities are addressed in case studies contained in the last six chapters. These issues include a range of behaviors — from the unintentional failure to cite sources properly to the stealing of words — of varying degrees of severity of plagiarism, the accuracy of a historian's use of a source, and the limiting of the use of historical documents by other scholars. Other improprieties addressed in these chapters are a set of behaviors dealing with intellectual property rights, such as the mining of footnotes from an unpublished dissertation, notifying other scholars of newly found documents, and the role of reputational status of the author and the reviewers in the journal manuscript review process. The rights and responsibilities of relationships between graduate students and faculty and the obligation of oral historians to be true to the words of their subjects are also discussed.

The major contribution *Research Ethics: Cases and Materials* makes is to teaching role performance. The intended audience for this edited book is thus clearly those college and university faculty members who teach courses on research ethics in their discipline or who include ethics in a research methods course. Both undergraduate and graduate level instruction in research ethics can benefit from this book; it will be useful to faculty who train future scholars as well as to those who instruct future consumers of research and scholarship. Its contribution to instructional practice lies not only in the review of the four ethical theories but also in the range of improprieties addressed by each of the cases developed through Project Catalyst. These cases also deal with other aspects of professional self-regulation, such as the procedures that research integrity committees should follow in investigating allegations of misconduct, the deliberations of institutional review boards for the protection of human subjects, and the response of individuals and research integrity committees to incidents of wrongdoing. In addition to the case studies, the review of the four ethical theories, which can be used in the analysis of possible research wrongdoing, is a noteworthy contribution to practice. The application of these approaches is particularly relevant to the actions of individuals who are personally aware of an incident of misconduct as well as to the meting out of sanctions by institutional research integrity committees. Also useful to faculty in their instruction of ethical issues are the questions for discussion that accompany most of the case studies and the instructional notes that are indexed to some of the case studies.

Although the primary contribution of *Research Ethics* is to instruction in the ethics of research and scholarship, this volume also has heuristic value to the systematic study of the process of professional self-regulation. Of particular value is the review of the four ethical theories. Given that Consequentialist Theory entails the assessment of harm as a consequence of action, the reasoning process associated with this approach may prove useful to research designed to reduce the degree of ambiguity between "crime and punishment" in the meting out of sanctions for scientific misconduct [5]. Also, the cases addressing ethical issues in history provide scholars of professional self-regulation with a window on how this discipline defines scholarly misconduct.

The book is not without shortcomings. First, it is contended that the four approaches to ethical analysis can be applied to most cases of wrongdoing; however, only cases that specifically apply the casuistry approach are provided. Given that this approach entails the comparison of the focal case to other similar cases, a singular focus on this approach may be warranted, but case studies that include more clearly delineated aspects of the other three approaches would have enhanced their application to cases of possible research misconduct. Another shortcoming is the inclusion of chapters devoted to genetic screening and testing, eugenics, and behavior modification. The ethicality of these issues is not questioned; however, these issues are more pertinent to professional practice — medicine or clinical psychology — than to research conduct. Their inclusion diffuses the focus of this work. The book, despite the impressive array of forms of scholarly malfeasance that are represented in the cases, neglects to include such notable improprieties as failure of practicing scholars to give appropriate authorship credit to a collaborator, failure to cite the pertinent scholarship of others, failure to provide detail on the execution of a research study or experiment, and the application of particularistic criteria (social or personal characteristics) rather than merit to assessment of an individual's research or scholarship. These improprieties represent violations of the norms of science delineated by Merton [3].

These shortcomings, however, do not diminish the value of this book's contribution to instructional practice. Although an entire course on research ethics could not be developed around it, the review of ethical theories and cases of wrongdoing pertinent to the focal academic discipline would well serve a course on research ethics. Alternately, a segment of a course on research methods would also be facilitated by using the chapter devoted to the review of ethical theories as well as those chapters focusing on cases of research misconduct in the focal discipline.

Beyond its contribution to instructional practice, this volume contributes to the process of professional self-regulation by the scholarly community. Through training in research ethics, scholars are able to participate more fully in the professional self-regulation process, which entails the deterrence, detection, and sanctioning of research misconduct [1,5]. The range of issues covered by the cases included in this volume in conjunction with the discussion of the ethical theories makes a significant contribution toward preparation for such professional self-regulation.

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Claudia E. Nunn

Discussion in the College Classroom

Triangulating Observational and Survey Results

Introduction

At the college level, "one would expect to find inquiring . . . minds being challenged by the intellectual and perceptive questions of learned professors — extensive Socratic dialogue and an active interchange of ideas" (Barnes, 1983, p. 79). Prior studies have demonstrated a positive relationship between student participation in classroom discussion and learning, motivation, and problem-solving ability (McKeachie, 1970; Smith, 1980). Nonetheless, learning appears to be a "spectator sport" at the college level with little time spent in discussion (Smith, 1983) and only a few students involved (Karp & Yoels, 1976).

Master teachers have offered much practical advice on "how to" stimulate participation (for example, call on students by name, ask for elaboration, praise students for their contributions) (Eble, 1976; Gullette, 1984; McKeachie, 1986; McKeachie, 1994; Neff & Weimer, 1989). "However, we have surprisingly little systematically collected empirical

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data on the impact of faculty members' behavior on students' participation; many of the strategies suggested for increasing student participation are based only on anecdotal evidence" (Auster & MacRone, 1994, p. 289). Hence, educational leaders have called for the systematic verification of the effectiveness of these techniques at the college level (Bonwell & Eison, 1991; Mentkowski & Chickering, 1987). Ellner (1983) emphasizes the need for such verification in "Piercing the College Veil."

Furthermore, observational studies of classroom interaction at the college level are infrequent, the few existing studies are dated (for example, Fischer & Grant, 1983; Karp & Yoels, 1976; Smith, 1983), and most studies were conducted in small private liberal arts colleges. The current study, which was conducted in a large public university and triangulates data from observations of actual classroom behavior with self-report surveys of faculty and students, provides important information regarding interaction in the college classroom.

Research Questions

Questions addressed include: How much student verbal participation occurs? Which techniques do teachers use in eliciting student participation or in responding to it? Is there a relationship between these teaching techniques and the amount of participation that occurs? Do students and teachers hold similar views about classroom interaction, and how do their views compare with observational findings?

Interaction Patterns in the College Classroom

In an observational study of 40 classrooms representing a variety of subject areas at two large public and two small private colleges, Fischer and Grant (1983) found that professors' talk occupied nearly 80% of the time. Smith's (1983) observations of 12 classes (in humanities, social sciences, and natural sciences) at a small liberal arts college also revealed that 80% of class time was spent in lecture, 14% in student participation, and the remaining 6% in teacher questions, praise, and criticism. Interestingly, this participation pattern was found to persist in introductory and advanced classes, in the natural and social sciences, and in classes observed at the beginning and end of the semester (Ellner, 1983). In contrast, high-school classes appear to be more interactive than college classes, with student participation accounting for 17% to 26% of class time (Flanders, cited in Amidon & Hough, 1967). Each of these studies used a "time-sampling" approach (Suen & Ary, 1989) for data collection based on Flanders' Interaction Analysis System (Flanders, 1970).

At the college level typically only 10 students in a class of 40 participate in discussion, and interaction is dominated by 5 of these students (Karp & Yoels, 1976). The vast majority (80%) of the questions asked by professors are at the lowest cognitive level — that is, recall of facts (Barnes, 1983). Because these observational studies revealed that little participation occurs, few students are involved, and teacher questions focus on recall rather than critical thinking, one must conclude that learning at the college level is indeed a "spectator sport."

Benefits of Participation

Cognitive psychologists (for example, Ausubel, 1968; Gagne, Yekovich, & Yekovich, 1994; Gredler, 1992; Wittrock, 1978) have demonstrated that long-term learning depends on the learner actively processing the material. Information that is not actively processed, but merely "recorded," is harder to retrieve from storage, less available for application to new situations, and more easily forgotten (Bransford, 1979; Craik, 1979). Research by McKeachie (1963) indicates that many faculty members have falsely assumed that students learn to use the higher order skills spontaneously in learning the subject itself. Nonetheless, the higher cognitive processes (that is, analysis, synthesis, evaluation) have been shown to require careful instruction and practice (Bloom, 1956).

> Learning is not a spectator sport. Students do not learn much just by sitting in classes listening to teachers, memorizing pre-packaged assignments, and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences, apply it to their daily lives. They must make what they learn part of themselves (Chickering & Gamson, 1987, p. 4).

Techniques that Encourage Participation

Using surveys with close-ended questions, Auster and MacRone (1994) examined the perceptions of 132 students in a private eastern liberal arts college regarding the impact of instructional behaviors on student participation. Their findings suggest that students believe the following techniques encourage participation: call on students when they volunteer, call on students by name, show signs of approval and interest, and encourage elaboration of questions and answers.

Although asking questions has been a recommended discussion stimulating technique from Socrates on, Dillon (1994) explicitly recommends against questioning by the teacher, because he believes that "teacher questions do not stimulate student thinking and they do not encourage participation. They depress student thought and talk" (p. 78). Instead of asking questions, he suggests that teachers state their own thoughts, use students' statements or questions, use emphatic expressions ("wonderful!") or fillers ("um-humm," "right"), or remain silent. Furthermore, findings from his studies of high-school social studies classes suggest that statements by teachers, rather than questions, lead to higher cognitive levels of student response (Dillon, 1990). Summarizing the literature, Dillon states: "In every case studied — toddlers at home, children in preschool, pupils in primary . . . and secondary school — the children responded at greater length and with greater initiative to statements than to questions. . . . The children not only talked far more, but they also talked far better in response to statements, going beyond to elaborate, to volunteer contributions and ideas, and to ask questions" (1994, pp. 79-80). Similarly, MacDonald (1989) observed that by using "reacting moves" (for example, repeating, highlighting, amplifying, recapitulating students' responses) instead of questioning, middle school social studies teachers encouraged more student talk as well as a greater number of students to talk.

Another alternative view regarding encouraging participation emerges from Fassinger's (1995) study, in which undergraduates in a small private midwestern liberal arts college were surveyed. Based on this research, student traits (for example, confidence about communicating) and class traits (for example, empathy and support of classmates) appear to be better predictors of students' silence or involvement than teacher behaviors (for example, supportive approach or positive feedback). Hence, to encourage classroom interaction, Fassinger suggests that students meet in small groups to discuss their insecurities about participating, create lists of behaviors that build/diminish confidence, and develop guidelines for classroom interaction.

Method

Sample

This study was conducted at a large state university in the northeast. The sample consisted of 20 professors and 579 of their students enrolled in upper-level undergraduate social science and humanities courses. The investigation focused on classes in English ($n = 4$), economics ($n = 4$), human development ($n = 3$), history ($n = 3$), psychology ($n = 2$), sociology ($n = 1$), anthropology ($n = 1$), geography ($n = 1$), and communication science ($n = 1$).[1]

Faculty. The faculty sample included 15 male and 5 female teachers[2] with a mean age of 44 years. Ninety-one percent of the faculty who were asked to participate in this study agreed to do so. In order to hold teaching ability constant, this study focused on "very good" teachers. Because student evaluations of faculty were confidential, administrators were asked to identify faculty who had "very good" teaching reputations, based on student ratings and general consensus. Furthermore, during the data collection phase, students in the study sample were asked to rate the teaching effectiveness of these faculty members (1 = very poor; 5 = very good), and 57% of the students rated these faculty members as "very good" teachers, while 32% rated them as "good teachers" ($M = 4.45$, $SD = 0.74$).[3]

Students. The student sample included 225 males and 354 females.[4] Classes ranged in size from 15 to 44 students with a median size of 29 ($M = 28.95$, $SD = 6.86$). Ninety-three percent of the students were juniors or seniors, and 73% indicated that this course was in their major. Approximately 99% of the students present in class on the day the survey was administered responded to it ($n = 566$).

Pilot Study

An examination of a large number of existing observational and survey instruments with proven reliability failed to yield any that measured the variables selected for investigation in this study (Bellack, Kliebard, & Hyman, 1966; Simon & Boyer, 1967). Therefore, this researcher created, refined, and validated the observational coding system, teacher survey, and student survey used in the current investigation.

This was accomplished by means of a pilot study conducted prior to the data collection phase which involved 23 faculty and 32 students. None of the faculty or students who participated in the pilot study participated in the actual study that followed. Through interviews and open-ended survey questions, these faculty and students were given the opportunity to discuss components of the classroom interaction process they felt were important and to suggest teaching techniques they saw as encouraging or discouraging interaction. Using this input plus information gained through a review of the literature, the researcher developed three data collection instruments. Also during the pilot study, the researcher refined the approach for recording the time spent in participation and the number of different students who participated (Table 1 in Results section).

Observational coding instrument. The observational coding instrument focused on 16 discussion-related teaching techniques, for example, teacher asks a question, praises a student, uses humor, repeats a student's answer (Table 2 in Results section). In order to refine the operational definitions for the 16 observational coding categories, the researcher observed six "out of sample" classes and coded interactions. Additional revisions were made as a result of coding three videotapes (also not part of the study sample). Then, to gain further practice with the final version of the observational instrument, the researcher attended three classes taught by a pilot study faculty member and coded interactions.

To determine the inter-rater reliability for the observational instrument, an independent observer was trained to use the coding system, and comparisons were made between codings of a segment of audiotape made by the independent observer and the researcher. Thus, the inter-rater reliability rate for this observational instrument was found to be 71% — which was deemed acceptable, given the nature of the observational system used (Suen & Ary, 1989). The inter-rater reliability rate jumped to 85% when coding disagreements over whether a question was "regular" or "rhetorical" were eliminated.

Survey instruments. The faculty survey and student surveys contained similar items (see Tables 3, 4, and 5 in the Results section) and were in 5-point Likert-type format (for example, 1 = greatly discourages; 5 = greatly encourages). Questions focused on the extent to which faculty and students perceived certain teaching techniques (for example, praise, use of student ideas, humor) as encouragers of student participation in classroom discussion (see nine items in Table 3). Each student was also asked to rate their faculty member on their overall teaching ability as well as their discussion-leading ability (five items in Table 5), and faculty also rated themselves on these five items (Table 5). Other questions asked students to indicate their frequency of participation in this class and other college classes, their fear about participating in this class and other college classes, and how much time they would like to see devoted to student participation (five items in Table 4). Faculty were asked to indicate how frequently they had participated in classroom discussion when they were college students and how much fear about participating they had experienced as college students (two items in Table 4). Faculty were also asked how much time they would currently like to devote to student participation (one item in Table 4). Thus, the student survey included 19 items, while the faculty survey had 17 items.

Six education faculty members reviewed the surveys to check for "face validity." In addition, one faculty member and four students offered feedback regarding initial drafts of the surveys. Cronbach's internal reliability for the student survey, assessed after the survey was administered to the 566 students in the study sample, was found to be 0.71 — which was deemed adequate for an affective instrument (Gable, 1986, p. 147).

Data Collection and Analysis

Classroom observations. Classroom observations were conducted during the third through fifth week of a fourteen-week semester. The researcher observed one class taught by each of the 20 faculty members in the sample. During each 40-minute observation period, the researcher audiotaped the class, took field notes, and recorded all occurrences of the 16 targeted teaching behaviors (Table 2 in Results section).

The researcher then listened to the audiotapes and coded interactions again as a check against codings made during class. Although the two sets of codings were quite similar, the opportunity to play the tape over and over led to some minor revisions of the in-class codes. The frequencies of the 16 selected teaching behaviors and the number of different students who spoke were tallied. A stopwatch was used to record beginning and ending times for each student's verbal contribution ("real-time" recording) (Suen & Ary, 1989, pp. 66–70). Because verbal participation can be operationally defined in two ways (that is, as the percentage of time spent in participation and as the percentage of students participating), both of these outcome measures were used to gauge participation in this study. Furthermore, the relationship between teaching techniques and both of these measures was tested. Descriptive statistics were used in the analysis of classroom observations, as were *t*-tests, *z*-tests for proportions, and a nonparametric correlation technique.[5]

Surveys. Toward the end of the semester (eleventh through thirteenth weeks) the researcher returned to the 20 sample classes to administer the student survey during the last 15 minutes of class. While the students were responding to the survey, the faculty member left the room to complete the faculty survey. Responses to the student and faculty surveys were then analyzed by means of descriptive statistics and item-level *t*-tests.

Data triangulation. Finally, after the data sets were analyzed individually, the findings were triangulated — that is, compared across data sets to see if there was agreement (Denzin, 1988). Specifically, data collected from three different sources (observer, students, and teachers) using two different methods (classroom observations and surveys) were compared in order to cross-check the conclusions and to strengthen the "construct validity" of this study (Cook & Campbell, 1979; Suen &

Ary, 1989). "The basic premise of triangulation is that the weaknesses of a particular method are compensated for by the strengths of other methods. . . . If data collected through different methods converge, greater confidence in the results is generated" (Statham, Richardson, Cook, 1991, p. 24).

Results

Amount of Interaction Observed

Analysis of observations of 20 classes revealed that typically only 2.28% (*MDN*) of class time was spent in student participation ($M = 5.86\%$, $SD = 7.21$) (see Table 1). While, in general, student talk occupied only about 1 minute out of the 40-minute observation period, individual classes showed great variability. As depicted in Figure 1, one faculty member had no participation, fifteen spent 1 to 9% of the time in participation, two spent 10 to 19% of the time in participation, and two faculty members spent 20 to 23% of the time in student participation. Overall, this study found much less time spent in participation in a large public university than was reported in earlier studies conducted in small private liberal arts colleges (Fischer & Grant, 1983; Smith, 1983).

Results suggest that, as found in earlier studies, typically only 25.46% (*MDN*) of the students participated in classroom discussion ($M = 26.10\%$, $SD = 19.32$), while the rest of the students remained silent (see Table 1). However, here too, there was a tremendous range: one faculty member had no participation, seven had 1 to 19% of the students participating, eight had 20 to 39%, and four had 40 to 63% of the students

TABLE 1

Descriptive Statistics for Amount of Time Spent in Participation and Number of Different Students Who Spoke — Observational Results ($N = 20$ faculty, 579 students)

Participation Variables	Median	Mean	*SD*	Range	Total for 20 classes
Amount of time spent in student participation per class	54.66 sec.	140.57	173.08	0–552	2811.48 sec.[a]
Percentage of time spent in student participation per class	2.28 %	5.86	7.21	0–23	
Number of different students who spoke per class	7.00 st.	7.25	5.49	0–19	145 st.
Percentage of students who spoke per class	25.46 %	26.10	19.32	0–63	

[a] This total includes amount of time males and females participated as individuals and also 135.69 seconds of time when students participated as a group.

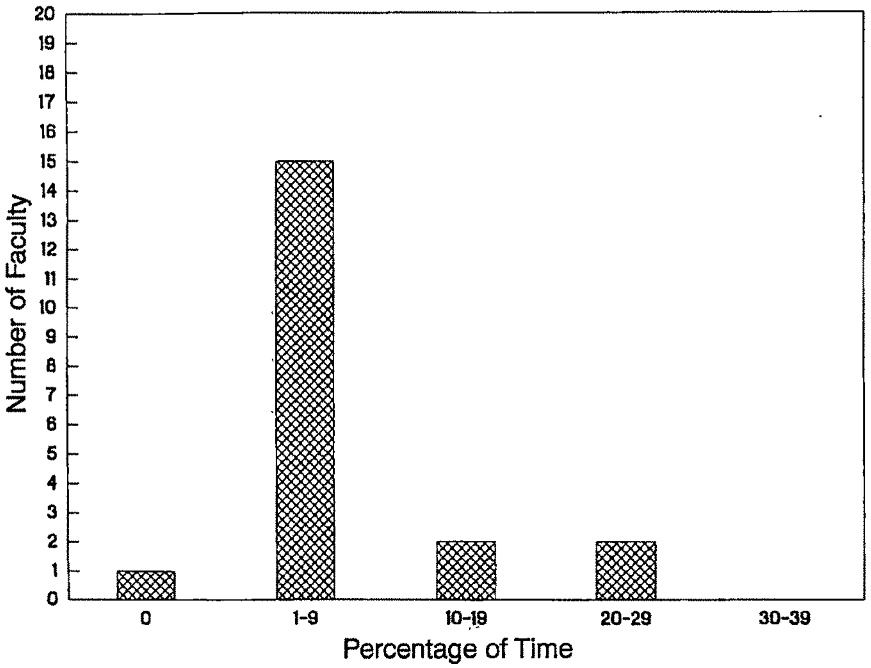

FIG. 1. Percentage of Time Spent in Participation

participating (see Figure 2). Interestingly, this observational finding (that is, that only a small percentage of class time was devoted to participation) was reinforced by findings from the student survey. When asked to describe their level of participation in the sample classes (Item #11), half the students reported participating "infrequently" or "almost never."

The Relationship between Techniques and Participation

As shown in Table 2, the pairwise correlation results indicated a statistically significant relationship ($p < 0.05$) between the following teaching techniques and the amount of time spent in student participation: praises student (rho = 0.74), teacher questions (rho = 0.65), teacher asks for elaboration of student question/answer (rho = 0.60), accepts student answer (for example, says "That's right") (rho = 0.59), repeats student answer (rho = 0.58), uses student name (rho = 0.52), corrects wrong answer (rho = 0.50). In addition, each of the above teaching techniques was significantly *correlated* ($p < 0.05$) with the number of different students speaking. Hence, the current study used two outcome measures to gauge student participation and found these teaching

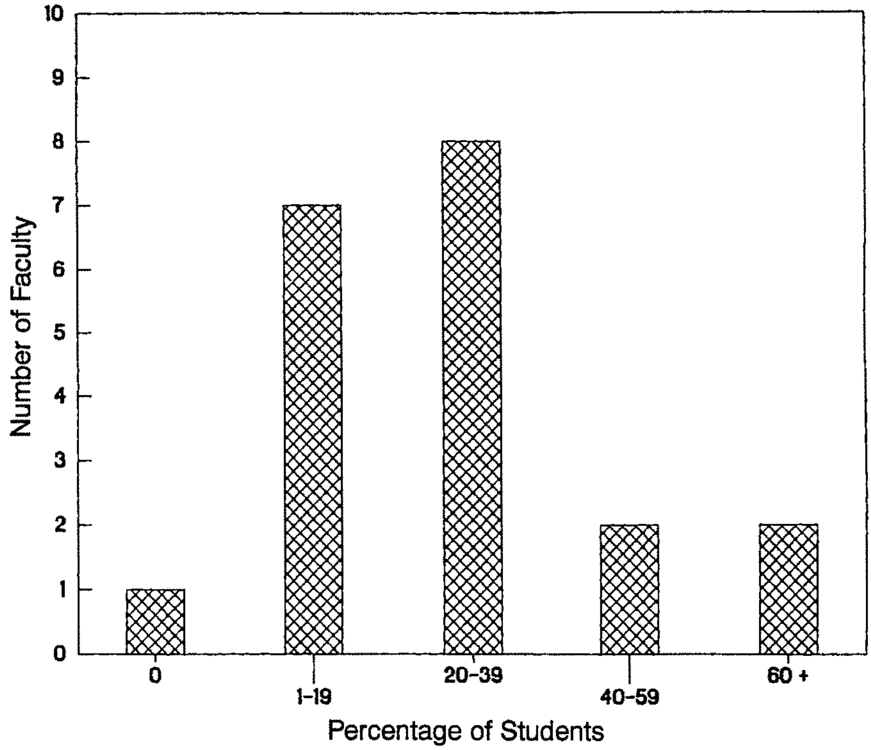

FIG. 2. Percentage of Students Participating in Classroom Discussion

techniques to correlate significantly with both time spent in participation as well as number of different students participating.

Other Variables and Their Relationship with Participation

Class size and participation. Expecting that more participation would be found in smaller classes (Auster & MacRone, 1994; Crawford & MacLeod, 1990), class size was controlled for in this study and sample classes ranged from 15 to 44 students. An inspection of the data failed to reveal a strong relationship between class size and participation. Nevertheless, for the four classes with 35 or more students the percentage of time spent participating as well as the percentage of students participating fell off markedly (see Figure 3).

Subject area and time spent in participation. Social science and humanities classes were selected for investigation with the expectation that classroom discussion would be likely. Yet within this group some variation was expected — with English, sociology, and history classes

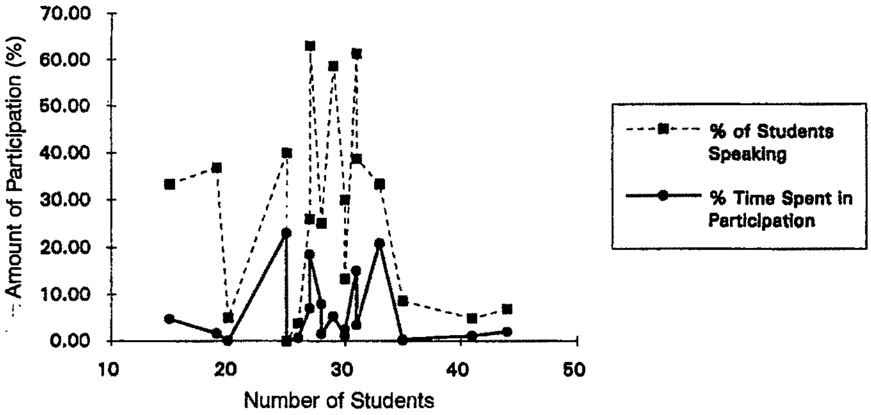

FIG. 3. Comparison of Class Size and Participation

expected to have more discussion than economics or geography classes. As predicted, three out of four English classes and two out of four sociology classes had relatively high percentages of time spent in participation, whereas none of the economics classes did. Surprisingly, two of the three history classes were found to have relatively low percentages of participation time.

Subject area and percentage of students participating. The following classes had relatively high percentages of students participating: two out of the four English classes, one of the two sociology classes, one of the three history classes. Unexpectedly, two out of four of the economics classes had relatively high percentages of participation, and field notes revealed that the economics classes were "recitation" classes in which rapid-fire questions were aimed at students and quick responses were expected. Surprisingly, two out of the three history classes had relatively low percentages of students speaking.

Frequency of Selected Teaching Techniques

As indicated in Table 2, the three most frequently used teaching techniques of the 16 discussion-related techniques selected for observation were teacher questions (total n for 20 classes = 440), rhetorical questions ($n = 392$), teacher asks for elaboration of student question/answer ($n = 201$). In contrast, the three least frequently used techniques were teacher says "That's wrong" ($n = 8$), uses student ideas ($n = 11$), and corrects wrong answer ($n = 12$).

Qualitative impressions recorded as field notes for the sample classes revealed that teachers were typically quite positive in their interaction with students rather than negative. These impressions were validated

TABLE 2

Frequencies for All Teaching Techniques and Correlations between Teaching Techniques and Participation — Observational Results ($N = 20$ faculty, 579 students)

						Correlation[a]	
Teaching technique	Median	Mean	*SD*	Total for 20 tch.	Range for individ. tch.	with seconds st. partic.	with no. of different st. who spoke
Teacher questions	18.50	22.00	19.30	440	0–76	0.65**	0.76***
Rhetorical questions	15.50	19.60	20.71	392	1–100	−0.37	−0.22
Humorous statements	7.00	7.45	5.96	149	0–22	0.20	−0.05
Tch. asks for elaboration	6.00	10.05	11.75	201	0–43	0.60**	0.79***
Tch. says: "That's right"	6.00	7.55	7.52	151	0–26	0.59**	0.79***
Repeats student answer	5.00	7.50	9.27	150	0–41	0.58**	0.75***
Colorful language	4.00	5.00	4.92	100	0–19	−0.41	−0.49*
Real life examples	2.00	5.70	7.62	114	0–27	−0.18	−0.31
Personal examples	1.00	2.20	2.75	44	0–11	0.02	−0.18
"I am human" statements	1.00	1.40	1.47	28	0–5	0.02	0.07
Praises student	0.50	1.50	3.56	30	0–16	0.74***	0.46*
Use of student ideas	0.00	0.55	0.89	11	0–3	0.38	0.45*
Corrects wrong answer	0.00	0.60	1.27	12	0–4	0.50*	0.61**
Example relevant to st.	0.00	1.35	3.12	27	0–14	−0.21	−0.40
Uses student name	0.00	2.20	3.96	44	0–15	0.52*	0.58**
Tch. says: "That's wrong"	0.00	0.40	0.75	8	0–3	0.29	0.40

[a] Nonparametric correlations listed are Spearman's rho.

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$, two-tailed tests.

by actual tallies of teacher behavior. Specifically, 342 instances of positive feedback were observed in total for the 20 classes: accepts student answer (for example, "That's right") ($n = 151$), repeats student answer ($n = 150$), praises student ($n = 30$), uses student ideas ($n = 11$). In contrast, only 8 instances of critical comments (for example, "That's wrong"), plus 12 corrections for wrong answers were observed.

It was expected from the literature that teachers would provide more positive than negative feedback to their students. For example, in clinical discussion groups for medical students, teacher encouragement and praise occupied 4% of class time, whereas teacher criticism occupied less than 1% (Foster, 1981). Similarly, praise was much more frequent than criticism in studies of high-school (Allen, 1985) and junior high classes (Crabtree, 1982).

Typically, the teachers in this study were found to ask 18.50 (*MDN*) questions per 40-minute period (range = 0 to 76 questions) (Table 2). This is much less than the 84 teacher questions per hour found in both elementary and secondary classrooms (Dillon, 1990, p. 7), or the 150 teacher questions per hour observed in elementary science and social studies classes (Gall, 1970). As shown in Table 2, teachers in the current study also made 7.00 (*MDN*) humorous statements (range = 0 to 22) during the typical class, which is slightly more than the amount reported in prior research. Responding to a self-report survey, faculty said they used, on average, 6 instances of humor per class (range = 1 to 13) (Neuliep, 1991). In contrast, classes at the University of Massachusetts appear to be considerably less humorous with only 3.34 instances of humor per class (Bryant, Comisky, & Zillmann, 1979). However, just as there was considerable variation in the amount of student participation in each class, individual faculty members also varied widely in their use of these targeted teaching techniques. For example, while one faculty member did not ask any questions, one asked 76.

Student and Faculty Views about Interaction

Students and teachers across classes appeared to hold similar views regarding participation, as illustrated in Tables 3, 4, and 5. For example, both groups viewed humor, use of student ideas, praise, a supportive atmosphere, and use of student names as relatively strong encouragers of student participation (see Table 3). Furthermore, out of the 17 parallel survey items subjected to *t*-tests, students and faculty were found to differ on only 1 item at the 0.001 level.[6] Specifically, faculty (M = 3.45) reported significantly more fear about participating in classroom discussion when they were students than was reported by the

TABLE 3

Item-Level *t*-Tests for Teacher/Student Differences on Teaching Technique Questions — Survey Results

Item #	Item name	Tch. *M*	*SD*	No. of tch.[a]	St. *M*	*SD*	No. of st.[a]	*t*
1	Praise	4.37	0.50	19	4.36	0.58	546	0.07
2	Criticism	2.12	1.17	17	2.06	0.93	546	0.26
3	Uses of student ideas	4.21	1.23	19	4.30	0.63	546	−0.30
4	Elaboration	3.84	0.69	19	3.40	0.83	546	2.32*
5	Grades participation	3.29	0.83	14	3.50	1.05	546	−0.74
6	Humor	4.26	0.56	19	4.40	0.61	546	−0.95
7	Supportive atmosphere	4.50	0.61	20	4.38	0.61	545	0.88
8	Use of student names	4.20	0.62	20	3.99	0.83	545	1.14
9	Put down	1.21	0.54	19	1.55	0.87	545	−2.66*

NOTE: For questions 1-9: 1 = greatly discourages (GD), 2 = discourages (D), 3 = no effect (NE), 4 = encourages (E), 5 = greatly encourages (GE).

[a] While 20 faculty surveys and 566 student surveys were passed in, incomplete information on some survey items led to a decrease in the number available for testing.

*$p < 0.05$, two-tailed tests.

TABLE 4

Item-Level *t*-Tests for Teacher/Student Differences on Items Regarding Their Own Participation — Survey Results

Item #	Item name	Tch. *M*	*SD*	No. of tch.	St. *M*	*SD*	No. of st.	*t*
10	Frequency of my partic. in class as a student	2.25	1.29	20	2.82	1.06	546	−2.35*
12	Fear about participating in class as a student	3.45	1.23	20	2.22	1.10	546	4.90***
14	Ideal % time to spend in participation[a]	2.60	0.82	20	2.64	0.85	546	−0.19

NOTE: For questions 10 and 12: 1 = almost never (AN), 2 = infrequently (I), 3 = sometimes (S), 4 = frequently (F), 5 = almost always (AA). For question 14: 1 = 0% of class time, 2 = 1-20%, 3 = 21-40%, 4 = 41-60%, 5 = more than 60%.

[a] Response options for this question involve unequal intervals; therefore the mean cannot be used for interpretation.

*$p < 0.05$, ***$p < 0.001$, two-tailed tests.

TABLE 5

Item-Level *t*-Tests for Teacher/Student Differences on Teacher Effectiveness/Discussion Climate Question — Survey Results

Item #	Item name	Tch. *M*	*SD*	No. of tch.	St. *M*	*SD*	No. of st.	*t*
15	Teaching ability of *this* teacher	4.53	0.70	19	4.44	0.74	542	0.49
16	Discussion leading ability	3.70	1.03	20	4.16	0.87	542	−2.29*
17	Students feel free to ask questions	4.35	0.59	20	4.20	0.85	542	0.78
18	Teacher tolerates different opinions	4.53	0.61	19	4.04	0.84	542	2.52*
19	Participation is worthwhile	4.15	0.93	20	3.87	0.92	529	1.34

NOTE: For questions 15-16: 1 = very poor (VP), 2 = poor (P), 3 = average (A), 4 = good (G), 5 = very good (VG). For questions 17-19: 1 = strongly disagree (SD), 2 = disagree (D), 3 = neither agree nor disagree (NAD), 4 = agree (A), 5 = strongly agree (SA).

*$p < 0.05$, two-tailed tests.

college students ($M = 2.22$) in the current sample ($t = 4.90, p = 0.000$, two-tailed test) (see Item #12 in Table 4).

Interestingly, the teachers perceived themselves as "good" to "very good" teachers ($M = 4.53$, $SD = 0.70$), but only "average" to "good" leaders of classroom discussion ($M = 3.70$, $SD = 1.03$) (see Table 5). Analysis via *t*-test revealed significant differences between these means ($t = 4.40$, $p = 0.000$, two-tailed test). Similarly, students rated these faculty members as significantly more effective at teaching ($M = 4.44$, $SD = 0.74$) than at discussion leading ($M = 4.16$, $SD = 0.87$) ($t = 9.22$, $p = 0.000$, two-tailed test).

As shown in Table 6, results indicate that every faculty member and

TABLE 6

Teacher and Student Responses to Survey Question Regarding Ideal Time to Spend in Participation — Survey Results

Item #	Variable	Percentage of respondents choosing response							
		M	*SD*	*N*	0%	1-20%	21-40%	41-60	>60%
Teacher response									
14	Ideal % time to spend in participation[a]	2.60	0.82	20	0.0	60.0	20.0	20.0	0.0
Student Response									
14	Ideal % time to spend in participation[a]	2.65	0.85	566	3.0	47.7	33.6	12.5	3.2

[a]Response options for this question involve unequal intervals; therefore the mean cannot be used for interpretation.

97% of the students believed that classes should involve some student participation. Specifically, 48% of the students and 60% of the faculty preferred to have "1 to 20%" of class time devoted to student participation, while 46% of the students and 40% of the faculty preferred 21 to 60% of the time devoted to participation.

Triangulation of Findings from Observations and Surveys

Triangulation of the data (see Table 7) from student survey, faculty survey, and classroom observations provided cross-validation of the strong relationship between classroom participation and two individual teaching techniques (praise and use of student names). According to the surveys, teachers ($M = 4.37$) and students ($M = 4.36$) saw praise as an encourager of participation, and an examination of the observational data revealed that the strong correlation between praise and the amount of time spent in participation was significant (rho = 0.74, $p < 0.001$). Teachers ($M = 4.20$) and students ($M = 3.99$) saw use of student names as an encourager of participation, and the moderate correlation between use of student names and the amount of time spent in participation was also significant (rho = 0.52, $p < 0.05$).

Because rating "supportive atmosphere" in each class would have been quite subjective and difficult to quantify, this researcher decided to use the following teacher behaviors to operationally define "supportive atmosphere": teacher praises students, says "That's right," uses students' names, and uses students' ideas.[7] Based on survey results, it

TABLE 7

Key Triangulation Findings Regarding the Relationship between Teaching Techniques and Student Participation — Observational and Survey Results

	Survey results[a]		Correlation[b]	
	Tch. *M*	St. *M*	with seconds st. partic.	with no. of different st. who spoke
Individual Tchg. Techniques				
Praise	4.37	4.36	0.74***	0.46*
Use of st. names	4.20	3.99	0.52*	0.58**
Composite Variable				
Supportive Atmosphere	4.50	4.38	Praise	
			0.74***	0.46*
			Teacher says "That's right"	
			0.59**	0.79***
			Use of student names	
			0.52*	0.58**
			Use of student ideas	
			0.38	0.45*

[a] For survey questions: 1 = greatly discourages, 2 = discourages, 3 = no effect, 4 = encourages, 5 = greatly encourages

[b] Spearman's correlation

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$, two-tailed tests.

appears that both teachers ($M = 4.50$) and students ($M = 4.38$) viewed a "supportive atmosphere" as an encourager of participation (see Table 7). Furthermore, the following teacher behaviors, which were used to operationally define "supportive atmosphere," were found to correlate strongly and significantly with the amount of time spent in participation: teacher praises students (rho = 0.74, $p < 0.001$), says "That's right" (rho = 0.59, $p < 0.01$), uses students' names (rho = 0.52, $p < 0.05$). However, one of the teacher behaviors used to operationally define supportive atmosphere, uses students' ideas, had a moderate but nonsignificant correlation with the amount of time spent in participation (rho = 0.38, NS) and a somewhat stronger and significant correlation with the number of participants (rho = 0.45, $p < 0.05$).

Additional findings. Results from the current study suggest that teaching techniques are strongly related to classroom participation. In fact, 96% of the students surveyed said praise "encourages" or "greatly encourages" their participation in discussion, and 77% said criticism "discourages" or "greatly discourages" participation. Moreover, 95% of the students indicated that a supportive atmosphere "encouraged" or "greatly encouraged" participation. These results, nevertheless, are in contrast with Fassinger's (1995) findings, which indicate that teacher behaviors (for example, whether the professor appeared to be supportive or provided positive feedback) do not play an important role in whether students participate.

The findings indicate that students and faculty members unanimously agreed that classes should involve some student interaction. However, students believed their teacher, that is, sampled faculty member, was less effective at discussion leading than at teaching in general. Sampled faculty also thought their discussion-leading skills were inferior to their general teaching ability. Moreover, when asked if they believed the participation that occurred in the sample classes was worthwhile, 6.5% of the students "disagreed" or "strongly disagreed," 21% were not sure, and 69.4% "agreed" or "strongly agreed" that the participation that occurred was worthwhile. As mentioned above, one possible implication of these findings is that "very good" teachers may need to improve their discussion-leading skills, however, students also may need to improve their participation skills (for example, learning to disagree in a noncombative way, to build on the contributions of others). Further, both groups may need to be educated regarding the learning benefits of participation discussed above.

Discussion

In summary, results of the current study suggest that little time was devoted to interaction and that few students were involved. Despite the disappointing amount of participation, findings suggest a strong relationship between participation and the following teaching techniques: praise, asking questions, probing for elaboration of student contributions, accepting answers, repeating answers, using student names, and correcting wrong answers. Triangulation of the data from classroom observations and surveys of students and teachers cross-validated the statistically significant relationship between participation and two individual variables (praise and use of student names) and one composite variable ("supportive atmosphere"). Furthermore, results suggest that teachers and students held similar views regarding classroom participation, saw participation as worthwhile, and desired higher levels of interaction than occurred in these classes.

Implications of the Current Study

If results of this study are representative of participation at the college level, the lack of interaction is unfortunate, because prior research has shown the cognitive benefits of verbal participation. Hence, the major implication of the current study is that college teachers who are rated as "very good" teachers (and possibly other faculty as well) should increase the amount of time spent in interaction and involve more students in order to maximize student learning. The findings of this study suggest that these teachers perceived themselves as less skilled at leading discussions than at teaching in general, and their students agreed. Hence, if these results can be generalized, faculty may need to develop additional skills and confidence in the discussion-leading area. It is also likely that students may need to improve their interaction skills in order to participate effectively in classroom discussion.

Furthermore, increasing numbers of adults, women, and minorities in today's college classrooms make this apparent lack of interaction an even more critical issue, because prior research has demonstrated that these groups require more interactive, concrete, practical, visual approaches to learning than did earlier generations of undergraduates (Schroeder, 1993).

Methodological Advantages of the Current Study

In comparison with the methodological approaches used in earlier research, the approach taken in the current study appears to be more exact. For example, many of the earlier studies (Ellner, 1983; Fischer & Grant, 1983; and Smith, 1983) used the Flanders Interaction Analysis System (Flanders, 1970), or a modified version of this system, in which the coder observes classroom interaction for three seconds and then codes the interaction into one of ten categories (for example, student talks, teacher lectures, silence, teacher praises student). Based on this "time-sampling" approach, the observer calculates the approximate percentage of time spent in student talk. Although Flanders's System has been extremely useful in investigating teacher-student interactions in more than one hundred studies, some disadvantages have been noted (Biddle & Anderson, 1986). In contrast, the current study involved a "real-time" recording approach, in which the researcher listened to tape recordings of classroom interactions with a stopwatch in hand and repeatedly (that is, 4 or 5 times) played back tape segments in order to tally the precise number of seconds spent in student talk (Suen & Ary, 1989, pp. 66–70). Future research might involve using both measurement approaches to analyze the same data set in order to see if Flanders's approach systematically over- or underestimates student talk time.

Furthermore, as discussed earlier, the current investigation addresses some of the methodological shortcomings inherent in earlier studies that relied solely on anecdotal comments from master teachers or student perceptions about techniques that could be used to stimulate classroom interaction. Although these perceptions have pointed the way, the current investigation takes the next step by using a triangulation approach in which data from observations of classroom interaction were compared with self-report surveys of students and faculty. In addition, the current study used two outcome measures for participation — time spent and number of different students participating, because both are important aspects of the participation process and because they serve as additional verification that these techniques are indeed related to participation. Another important feature of this study is that the survey questions and observational instrument emerged from input regarding issues the faculty and students in the pilot study thought were important to investigate in the area of classroom participation.

Limitations

Because the sample consisted of 20 "very good" teachers of social science and humanities classes and 579 of their students in a single university, the generalizability of the findings beyond the sample is restricted. In addition, the relatively small amount of participation observed in this study may be an artifact of the methodology employed. Perhaps students felt intimidated by the presence of an observer with a tape recorder. Had several sessions been observed, the students might have grown accustomed to the researcher and the results might have been different. Moreover, although praise, use of student names, and a "supportive atmosphere" were found to be significantly correlated with participation, to determine whether these variables actually cause participation, additional research of an experimental nature would be necessary (Borg & Gall, 1983, p. 575).

Despite the fact that 7 of the 16 targeted teaching techniques showed relatively strong correlations with the amount of time spent in participation, some correlations may have been depressed due to curvilinear relationships. Unfortunately, because of the small number of observations involved in this study (that is, 20), the curvilinearity could not be assessed by examining bivariate plots. Also, though some of the teaching techniques studied showed a high degree of intercorrelation, data limitations (that is, skewed data, small sample size, low case to variable ratio) prevented the use of factor analysis to identify the dimensions underlying such intercorrelations.

In addition, to truly understand interaction in the college classroom, a great variety of "presage," "context," "process," and "product" variables would need to be explored (Dunkin & Biddle, 1974). Other variables to consider include students' level of communication apprehension, intellectual development (Perry, 1970), and motivation. For instance, the results from a survey of twenty thousand college students indicate that 15 to 20% suffer from "communication apprehension" (that is, fear of verbal interaction) severe enough to seriously interfere with their normal functioning in the classroom (McCroskey, 1977a, 1977b). Moreover, some researchers view verbal behaviors as an adequate representation of total behavior (Amidon & Hough, 1967, Aschner, 1960), whereas other researchers underscore the importance of nonverbal interaction (for example, Civikly, 1992). Batchelder and Keane (1977) found that one-third of the behaviors in elementary school mathematics and English classes are nonverbal and must be considered part of the total class interaction. Similarly, nonverbal behaviors, such as smiles, nods, pitch of voice, eye gaze, body stance (Woolfolk & Brooks, 1983), and wait-time (Rowe, 1974) have been shown to play an important role in classroom interaction.

Other factors that have been shown to affect classroom interaction are student gender and teacher gender. According to some researchers, the classroom climate is a "chilly" one for women — with college males participating more often, receiving more teacher encouragement, having more influence than females (Hall, 1982), and asking and answering more questions (Peters, 1978). Krupnick (1985) noted that at Harvard males dominated discussion, but especially so when the teacher was male and the class had a majority of males. Pearson and West (1991) report that in college communication classes female students ask fewer questions than male students in courses taught by males, and male teachers receive more questions than female teachers.

Thus, classroom interaction is indeed a complex process that is affected by many additional variables besides specific teaching techniques used by faculty members. Nevertheless, although such underlying factors may affect student participation, most are beyond the teacher's control. Hence, the focus of the investigation was on simple microtechniques that could be used by teachers who desire to devote even a brief amount of time to classroom discussion. Researchers and practitioners are invited to review the findings as possible stepping stones to further investigation.

Suggested Avenues for Future Research

Given the findings of the current study, it is recommended that the following questions be investigated further. Why are teachers perceived as significantly less effective at discussion leading than at teaching in general? Why is a sizeable group of students unwilling to describe the participation taking place as worthwhile? What reasons do students give for participating in discussion or for remaining silent? What sort of training for college teachers would be effective in helping them lead good discussions? What sort of training do students need to improve their discussion skills?

Notes

[1] Data collection took place during fall semester 1989.

[2] Because research has shown a relationship between teacher gender and student participation (Krupnick, 1985; Pearson & West, 1991), the 75% male/25% female faculty ratio in the study sample was kept similar to the 78% male/22% female faculty ratio at the university (Office of Institutional Research, 1990). Some faculty nominated by administrators as "very good" teachers were not asked to participate because for ease of data collection a balance was sought between M/W/F and Tu/Th classes.

[3] Typically, the faculty had taught the course many times ($M = 11$) prior to the study.

[4] When compared with the university student population (48% M, 52% F), the study sample had proportionately fewer men (39%) than women (61%). This may have occurred because females have traditionally enrolled more heavily in social science and humanities courses.

[5] Medians were used for observational data in this study because they are more accurate measures of central tendency where distributions are highly skewed (Capon, 1988, p.43; Neter, Wasserman, & Whitmore, 1988, p.63). Also, because of the skewed data, it was decided to use a nonparametric correlation technique.

[6] Due to the large number of individual t-tests performed (that is, 17), a very conservative alpha level ($p < 0.001$) was used based on the Bonferroni calculation (Hinkle, Jurs, Wiersma, 1979, p. 270).

[7] Although it would have been desirable to perform a factor analysis on the 16 teaching technique variables and then test the factor to see if it correlated with participation, this was impossible due to the skewed data, small number of observations ($n = 20$), and low case to variable ratio.

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Power Bases of Faculty Supervisors and Educational Outcomes for Graduate Students

Introduction

Power is a topic that receives consistent attention from educational researchers. At the macro level, theories of power help explain decisions about the selection of an academic program for termination [28], varying levels of institutional research activity [31], and decisions regarding higher education policy [50]. At the micro level, researchers are interested in power perceptions and their impact on outcome variables such as quality of interpersonal relationships and educational success. The last decade of educational research has been particularly prolific on the topic of power perceptions and their correlates, especially in higher education. For example, Dry [18] examined

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power relationships between administrators, faculty, and students; Fisher [21] investigated university presidents' power bases; Ranta [55] reported deans' power in areas such as rule-making, budgets, scheduling, curriculum development, and staffing; and Whitson and Hubert [73] measured department chairpersons' perceptions of faculty power. An area that has not been similarly scrutinized, however, is the dyadic power relationship between graduate students and supervising professors.

The Importance of Power in Faculty-Student Interactions

Graduate education is frequently portrayed as an intimate relationship between a supervising professor and a student [51]. Graduate students regard their relationship with members of the faculty as the most important aspect of the quality of their graduate education [30]. Moreover, researchers frequently describe the relationship and interactions between faculty and students as one of the most important factors affecting students' satisfaction with a graduate program [cf. 11, 29, 60]. In addition, graduate education is often represented as a student socialization and development process mainly influenced by student-faculty interrelationships [12, 35]. Accordingly, the degree to which faculty can influence students and the *power relationship* between graduate students and their faculty supervisors is often described as one of the most critical determinants of graduate students' success [10].

Graduate students' perceptions of the power of supervising faculty are assumed to influence the relationship between them, and ultimately, educational outcomes such as (a) graduate students' satisfaction with the graduate program and university environment, (b) students' mood and morale, (c) number of years spent in graduate school before graduation, and (d) future career success [cf. 33, 62]. Because the power relationship between faculty and student can determine students' success or failure, several researchers have investigated this issue empirically. However, the topic is still seriously underinvestigated.

Power in Faculty-Student Interactions: An Underinvestigated Issue

The aforementioned contentions regarding the importance of students' perceptions of the power of professors seem to be indirectly supported by research at the *elementary school* [36, 47] and *undergraduate* [57, 61] level, showing that students' perceptions of instructors' power affect learning and motivation. However, despite the considerable interest and hypothesized relevance of power in faculty-student relationships in *graduate* education, the empirical information on the topic is only tangential. For instance, Baker [9] examined power relationships among graduate teaching assistants (TAs), but no information was gathered regarding TA-faculty interactions. Also, Feld [20] examined whether a sample of graduate social work students perceived themselves, in general, as being more powerful than graduate business students. However, and similar to Baker [9], self-perceptions of power were not provided regarding faculty-student relationships. In another recent article, Heinrich [33] utilized rigorous qualitative methods for collecting and analyzing experiences in graduate school (including power relationships) from an all-female sample of twenty-two students. In this case, the overall power relationship between faculty and students was considered, but because of Heinrich's small and exclusively female sample and unstructured data collection procedures, the results may not generalize to other settings, samples, and methodologies (see West [72]).

Other researchers have shown interest in investigating influence strategies and the use of power. Madonna, Wesley, Bailey, and Anderson [39], for instance, investigated the use of an influence strategy labeled "Machiavellianism," defined as "the extent to which an individual uses manipulative strategies to gain control over interpersonal situations" (p. 953). The sample included freshmen undergraduate, upper-class undergraduate, and graduate students, and the results indicated that freshmen reported lower frequency use of Machiavellianism than the other two groups. However, despite the interesting findings and important contribution of this research, no information was gathered regarding (1) use of Machiavellianism in faculty-student interactions, (2) use of additional influence strategies, and (3) students' perceptions regarding faculty power. In another recent study on the use of power, Robyak, Goodyear, Prange, and Donham [58] investigated counseling psychology graduate students' preference for the use of various power resources such as expertise. However, this study examined power use in the context of student-client relationships, and thus no information was provided regarding supervising professors-graduate students relationships. Finally, additional empirical and theoretical work related to power in graduate student-faculty and other differential power relationships has focused on sexual harassment rather than power perceptions and their correlates [cf. 22, 27, 41, 52].

In sum, the topic of power relationships between faculty and students in higher education has not been directly studied. In particular, the important issue of whether students' perceptions of faculty power are associated with relevant outcomes and variables has not yet been investigated.

Power: Definition and Measurement Difficulties

In addition to the scarcity of empirical research on power in graduate student-faculty relationships, the few studies conducted in this area have typically relied on implicit or ambiguous definitions of the construct of power. This is a rather pervasive problem, so the examples that we use next should not indicate that we devalue these studies; we just selected them for illustrative purposes. For instance, Robyak et al. [58] used "power" as a synonym for "influence," without defining either concept. As a second illustration of problems regarding the definition and operationalization of power, Rouse [62] used only one-item scales to measure multidimensional constructs such as expert power and reward power. Strong criticisms have been raised against this practice [53, 63], because using only one item may be insufficient and inadequate to capture the construct in question and thus poses a serious threat to the validity of the results (i.e., "construct underrepresentation," [17, p. 64]).

An additional example of difficulties in defining and measuring the construct of power is a study conducted by Gilbert [25], in which graduate students were asked to assess the "power and influence" of those whom they "consider[ed] to be the strongest model for [them] at the present time." However, in this study there were several problems regarding the concept of power. First, the author intended to measure "power and influence," terms which were not defined and apparently were considered to be the same, or at least part of the same underlying construct. However, numerous authors have argued that there is a clear distinction between these two concepts (see Tedeschi and Nesler [70] for a recent review). Second, a prediction regarding possible gender differences in "power and influence" (p. 113) was based on research on status and prestige. Thus, apparently, power and influence could be narrowly equated to status and prestige. Third, the Power and Influence scale used included four items. The only item reported by Gilbert is "person's authority in the department" (p. 116), and consequently power and influence seem to be equated to "legitimate authority." Given the lack of definition and narrow operationalization of the construct of power, it is not surprising that no relationships were found between the power and influence variable and other constructs measured [cf. 37].

The difficulties in defining and measuring power led to a historical review of the concept by Mitchell and Spady [43], an examination of the treatment of the concept in introductory textbooks by Paap [49], as well as a more recent review of the concept of power as it relates and differentiates from influence by Tedeschi and Nesler [70]. As compellingly argued by Cook and Campbell [17], when a construct (e.g., power) is not clearly defined, the operationalizations of this construct may be invalid. Thus, the subsequent use of power perceptions as antecedents of graduate students' behavior and attitudes may result in invalid findings [cf. 17]. Alternatively, a more precise definition of power and its various components would allow researchers interested in power in graduate faculty-student relationships to define more adequately and investigate the relationship between specific power perceptions and graduate students' (1) perceptions (e.g., of faculty trustworthiness), (2) intentions (e.g., to invite supervising professor to chair a thesis or dissertation committee), and (3) behaviors (e.g., research productivity). To overcome previous theoretical limitations of power research in graduate student-faculty relationships, we adopted the power taxonomy proposed by French and Raven [23].

The French and Raven Power Taxonomy

The power bases taxonomy proposed by French and Raven [23] is a consensually accepted theoretical framework for the study of power in several social sciences, such as psychology [45, 53], management [74], and social work [20]. In addition, this taxonomy has been recently utilized in other disciplines such as health care [56], marketing [24], and medicine [59].

The French and Raven power taxonomy is especially relevant to the study of supervising professor-student power interactions because it is a theory of power that applies to *dyadic relationships*. French and Raven defined power as the ability or potential of an agent (e.g., supervising professor) to alter a target's (e.g., graduate student) behavior, intentions, attitudes, beliefs, emotions, or values. In addition, they distinguished five bases of power, which contribute to the agent's overall ability to alter a target: (1) referent (based on the target's desire to be associated with the agent), (2) coercive (based on the target's belief that the agent has the ability to punish him or her), (3) expert (based on the target's belief that the agent can provide him or her with special knowledge), (4) legitimate (based on the target's perception that the agent has the legitimate right to influence the target and that he or she is obligated to comply), and (5) reward (based on the target's belief that the agent has the ability to provide him or her with desired tangible or intangible benefits). According to this perspective, the agent's power (i.e., his or her ability or potential to alter a target) is a function of the perceptions of a target.

French and Raven distinguished power from influence [70]. Whereas power refers to the *ability* or *potential* of an agent to alter a target's behavior, intentions, attitudes, beliefs, emotions, or values, influence refers to the *use* of power. Thus, influence refers to the actual use of power, for example, in the form of influence tactics such as threats (use of coercive power) and promises (use of reward power).

The Present Study

Although the power relationship between faculty and students in higher education is assumed to be a major determinant of the relationship between them and, ultimately, of graduate student success and satisfaction with the graduate experience [cf. 33, 62], no empirical research to date has tested specific hypotheses regarding these relationships. Consequently, the goal of the present study was to address the need to investigate systematically power in graduate supervisor-student relationships. We used the French and Raven [23] power taxonomy to examine the power of graduate supervisors as perceived by their graduate students and the *main* and *interactive* effects of the five power bases on three types of outcome variables: students' (1) perceptions, (2) intentions, and (3) behaviors.

Hypotheses

Effects of Professors' Power on Students' Perceptions. (1) *Students' perceptions of the quality of the professor-student relationship* are predicted to be negatively related to supervisors' coercive power and positively related to referent and expert power [cf. 48, 67] (Hypothesis 1). (2) *Students' perceptions of professors' trustworthiness* are predicted to be negatively related to students' perceptions of professors' coercive power and positively related to referent and expert power [cf. 44, 71] (Hypothesis 2). (3) *Students' perceptions of professors' credibility* are hypothesized to be positively related to perceptions of supervisors' expert and referent power [cf. 45] (Hypothesis 3).

Effects of Professors' Power on Students' Intentions. (1) *Students' intentions to invite their supervising professor to serve or chair a dissertation/thesis committee* are hypothesized to be negatively related to coercive power and positively related to expert and referent power [cf. 10] (Hypothesis 4). (2) *Students' intentions to conduct research* with their current supervisor in the future are also predicted to be negatively related to coercive power and positively related to expert and referent power [cf. 10] (Hypothesis 5).

Effects of Professors' Power on Students' Behavior. (1) A number of behaviors that evidence *research productivity* are hypothesized to be influenced by the professor-student power relationship (Hypothesis 6). Coercive power is predicted to be negatively associated, and reward, referent, and expert power are predicted to be positively associated with research productivity [cf. 33]. (2) In addition, we hypothesized that students' *compliance* with their supervisors' requests would be positively related to perceptions of professors' legitimate, reward, expert, and referent power [cf. 75] (Hypothesis 7).

Method

Subjects

Surveys were mailed to all ($N = 967$) graduate students with assistantship assignments in a large northeastern state university. This type of methodology is common in higher education because it yields information that can be useful for theory development as well as institutional decision making [8]. The sample only included students with assistantship duties, because the relationship between supervising professor and student allows for qualitatively richer interactions regarding power than relationships in which the professor does not supervise assistantship duties. Stated differently, professors who supervise assistantship duties are in closer contact with their students and, consequently, tend to have a greater variety of power sources than professors who do not. For example, professors who supervise assistantship duties have the opportunity to interact more frequently with students and may therefore have the ability to acquire not only legitimate power but also referent and coercive power, which are power sources that may not be available to professors who do not supervise assistantship duties.

A total of 346 completed questionnaires were received, for a response rate of 35.78%. Although this return rate may be considered to be low, it is rather typical for surveys conducted using mailed questionnaires [42]. For example, in recent studies, Braxton, Brier, and Hossler [13] realized a return rate of 40.0%, Goodwin and Stevens [26] a return rate of 34.4%, and McCabe and Trevino [40] a return rate of 38.3% of the surveys mailed.

Some surveys had to be discarded because of incomplete information. Final sample sizes for the measured scales ranged from 315 to 331. Before conducting any of the substantive (i.e., theory-based) analyses described below, we conducted numerous descriptive and inferential analyses based on (a) gender, (b) university school, and (c) department. First, the sample-based results were similar to those found at the campuswide levels in terms of gender and campus unit-based proportions. Second, ANOVAs using the three aforementioned variables as independent factors and this study's relevant variables as dependent factors (i.e., power bases perceptions, credibility, etc.) yielded statistically nonsignificant results. Consequently, we feel confident that (a) the sample was representative of the population (at least regarding gender, university school, and department), and unreturned surveys were random, and (b) the lack of differences across departments and schools allows for the aggregation of respondents across these variables.

Measures

The surveys included scales to measure (1) students' perceptions of supervising professors' power bases, (2) outcome variables (i.e., students' perceptions, intentions, and behaviors), and (3) demographic variables. Following recent developments regarding scale and questionnaire construction [65, 66], and other recent survey-based research [for example, 19], most of the questions were answered on 19-point scales with anchors ranging from "strongly disagree" (−9) to "strongly agree" (+9), with higher scores representing a greater endorsement of the items. Graduate students were asked to respond to the questions regarding their "supervisor in assistantship duties" (Appendix A includes the instructions read by participants).

Perceptions of supervising professors' power bases. The five French and Raven bases of power were measured using a modified version of the Hinkin and Schriesheim [34] scales. These scales consist of four items measuring each of the five power bases (i.e., referent, coercive, expert, legitimate, and reward). Although one may argue that four items may not be sufficient to cover the power bases constructs, the construct validity and reliability of these scales have been strongly supported by thorough investigations that have used confirmatory factor analysis techniques in both laboratory and field settings [for example, 3, 34, 45]. Also, in developing these scales, Hinkin and Schriesheim followed a process that included (a) the development of conceptually consistent, theoretical definitions of the five power bases, (b) the generation of items that were content valid using two panels of independent judges (*ns* = 37 and 42), (c) the administration of the resulting items to three independent and diverse samples (251 undergraduate students, 375 full-time hospital employees, and 220 part-time MBA students), and (d) the examination of relationships between the five power bases and other constructs. Based on the results, Hinkin and Schriesheim concluded that these measures of power bases "have built-in content validity and that they have demonstrated reasonable internal consistent reliability, factor structure, discriminant validity, and criterion-related validity" (p. 566).

Some of the items had to be slightly modified for the context of professor-student relationships. For example, a *Reward* item in the original scale such as "My supervisor can influence my getting a promotion" was not relevant and was replaced by "My supervisor can write a strong letter of recommendation on my behalf." Appendix B includes the items utilized to measure students' perceptions of professors' five power bases, as well as the items used to measure all of the scales described below.

Outcome variables. Three types of outcome measures were included in the questionnaire: (1) students' perceptions, (2) students' intentions, and (3) students' behaviors.

1. *Students' perceptions.* (1) *Relationship quality* perceptions were measured using the question "How would you describe your overall relationship with your supervisor?" with anchors "very positive/very negative," and "very distant/very close." (2) *Trustworthiness,* defined as "a lack of intent to exploit or mislead a target" [44, p. 35], was measured using five items (see Appendix B). (3) *Credibility,* defined as "truthfulness, follow-through, and accuracy of a source" [45, p. 1406], was measured using six items developed by Nesler et al. [45] (see Appendix B).

2. *Students' intentions.* (1) *Students' intentions to invite the supervising professor to serve or chair a dissertation/thesis committee* were measured with the items "Rate the likelihood that your supervisor will chair your thesis or dissertation committee" and "Rate the likelihood that your supervisor will serve on your thesis or dissertation committee," ranging from "very likely" to "very unlikely." (2) *Students' intentions to conduct research* with his or her current supervisor in the future were measured with the item "How many projects are you working on that you plan to submit as coauthor with your supervisor to a conference or journal?"

3. *Students' behaviors.* (1) *Research productivity* was measured with the questions "How many publications have you coauthored with your supervisor?" and "How many conference papers have you coauthored with your supervisor?" (2) *Compliance,* defined as "the extent to which a subordinate actually carries out his or her superior's directives," was measured with two items adapted from Rahim and Afza [54] (see Appendix B).

Demographic Variables. This section of the questionnaire included questions regarding (1) student's type of program (doctorate or master's), (2) tenure with current graduate supervisor, (3) student's gender, (4) supervisor's gender, (5) supervisor's academic rank, (6) student's university school, (7) student's source of funding (i.e., grants, department), (8) student's age, and (9) student's tenure in school.

Results

Demographic and Personal Information

The percentage of male students was 48.27, and the percentage of male supervisors was 69.36. There were more professors (40.46%) than associate (26.88%) or assistant (15.32%) professors. Respondents were mainly from the School of Arts and Sciences (53.76%), followed by Public Affairs (13.87%), Education (11.27%), Public Health (8.96%), and Business (6.65%) (5.2% of respondents did not specify their school).

In regard to funding, the departments were the most typical source of support, except for the School of Public Health, which was the only school in which more students (67.74%) were funded by external grants rather than departmental budgets.

Of the total sample, 64.16% sought a doctoral degree. The respondents' mean age was 28.7 years, mean tenure in school was 2.7 years, and mean tenure with current supervisor was 1.7 years.[1]

Analyses of variance (ANOVAs) were conducted to test whether ratings on the five power bases were associated with (1) university school, (2) supervisor gender, (3) student gender, (4) supervisor academic rank, (5) source of funding, and (6) degree sought. All F-statistics were statistically nonsignificant (*p*s > 0.05). In addition, correlation coefficients were computed between each of the five power bases ratings and (1) tenure in school and (2) tenure with supervisor. These analyses also yielded statistically nonsignificant results (*p*s > 0.05). Therefore, all subsequent substantive analyses were conducted collapsing across these variables.

Psychometric Properties of the Scales

The scale means, standard deviations, and reliabilities estimates are presented in Table 1. Cronbach's alphas for the five power base scales support the previous evidence regarding the excellent reliabilities of these scales [cf. 34, 45]. Reliability estimates for the *Quality of Relationship, Credibility* and *Compliance* scales were all above 0.80. The alpha coefficient for the *Trustworthiness* scale was above the 0.70 recommended by Nunnally [46] for newly developed items.

TABLE 1

Scale Means, Standard Deviations, Cronbach's Alpha Reliability Estimates, and Number of Respondents

	Mean	*SD*	*Alpha*	*N*
Power Bases				
Coercive power	−1.16	5.01	0.84	323
Expert power	5.12	4.00	0.90	328
Legitimate power	5.38	3.03	0.87	321
Referent power	4.80	3.89	0.90	328
Reward power	3.67	3.49	0.73	324
Outcome Variables				
Perceptions				
Quality of relationship	4.27	4.29	0.91	331
Trustworthiness	3.65	4.03	0.75	319
Credibility	5.59	3.83	0.94	323
Intentions				
Invite supervisor to serve on dissertation or thesis committee[a]	3.61	7.16	—	315
Invite supervisor to chair dissertation or thesis committee[a]	2.10	7.61	—	318
Submit papers to conferences or journals[a]	0.84	1.28	—	325
Behaviors				
Number of publications[a]	0.41	1.10	—	324
Number of conference papers[a]	0.67	1.92	—	326
Compliance	5.21	3.34	0.81	326

NOTE: Individual items were rated on 19-point Likert-type scales ranging from −9 (strongly disagree) to +9 (strongly agree), with higher scores representing a greater endorsement of the items.
[a] Measured using one item only.

Data Analysis Strategy: Moderated Multiple Regression

We utilized moderated multiple regression (MMR) in order to examine both the *main* and *interactive* effects of the five power bases on the criterion variables (students' perceptions, intentions, and behaviors). MMR consists of comparing least-squares regression equations [16], and is especially suited for the examination of relationships among continuous variables [4, 54] such as power ratings. Given a criterion or dependent variable Y (e.g., compliance), a predictor X (e.g., referent power) and a second predictor Z (e.g., legitimate power) hypothesized to interact with X in affecting Y, the first regression equation (i.e., Step I) tests the additive model of the main effects for predicting Y from X and Z. The second equation (i.e., Step II) adds a third term, which carries information regarding the X by Z interaction, obtained by multiplying the predictors (i.e., $X \times Z$). To test for the statistical significance of the interaction between X and Z, the coefficient of determination (i.e., squared multiple correlation coefficient, R^2) is computed for each of the two equations, and an F-statistic that tests for the difference between the two R^2s (i.e., ΔR^2) is calculated. MMR is routinely utilized in education, psychology, and numerous other social sciences [1, 5, 6, 7].

In the following sections, we report results of MMR regressing the criterion variables on the main and second-order interactive effects of the five power bases. For all of the criterion variables, the contribution of the three-order, four-order, and five-order interactive effects never accounted for more than 5% in the criterion variables variance above and beyond that accounted for main and second-order effects. Consequently, and in spite of occasional statistical significance, three- and higher-order interactions are not reported [cf. 15].

In interpreting the various effects of the power bases, we first consider their second-order interactive effects, followed by the main effects. The reason for this is that the main effects of a power base cannot be easily interpreted if that variable interacts with one or more of the other bases in determining the values of a criterion variable. Stated differently, in the presence of interactions, main effects represent the average effects of a variable across relevant levels of the other variables [6, 48]. A significant interaction indicates that this average has been computed across *heterogenous* values. Thus, the interpretation of a second-order interaction yields more detailed and precise information about the impact of one power base on the criterion variable at specific levels or values of the second power base. Alternatively, the interpretation of main effects provides more generalizable, but less precise information.

Probing of the various interaction effects was accomplished by utilizing plotting techniques adapted from Aiken and West [7, pp. 12-14] and Cohen and Cohen [16, pp. 315-317]. In plotting the various interactions, we conducted the following two-step procedure (1) variables not participating in the interaction were fixed to a constant value (i.e., zero), and (2) all possible combinations of the highest (i.e., 9) and lowest (i.e., -9) scale values for each of the predictor variables participating in the interaction were entered in the resulting unstandardized regression equation to predict criterion variable values. Consequently, the figures shown below include predicted criterion variable scores for all combinations of high and low predictor variable values. Note that we chose the highest and lowest possible scale values so that the nature and form of the interactions become easily visualized.

Lastly, and because product terms also carry information about the main effects [16], the tables shown below include regression statistics computed after the second-order terms have been entered into each specific equation.

Effects of Power Bases on Outcome Measures

Students' perceptions. Tables 2-4 show the MMR results of regressing students' perceptions of (1) quality of professor-student relationship, (2) professors' credibility, and (3) professors' trustworthiness on the five power bases.

1. *Quality of professor-student relationship.* Table 2 shows that four of the five power bases were related to students' perceptions regarding their relationship with their supervising professors. Perceptions of a professor as having high referent, expert, and reward power contributed to more positive relationship ratings. On the other hand, the greater the perceived coercive power of supervising professors, the lower the perceived quality of professor-student relationships. Overall, an impressive 68.44% of the variance in quality of relationship ratings was accounted for by the power bases. No interactive effects were found.

2. *Professors' trustworthiness.* Table 3 summarizes the MMR results of regressing perceptions of professors' trustworthiness on the five power bases. After entering the two-way interactions into the equation, 57.56% of the variance in trustworthiness ratings was accounted for by the main and interactive effects of the power bases. Next, the two statistically significant two-way interactions are described, and then we turn to the main effects.

Two-way interactions. The Referent by Coercive and Coercive by Legitimate interactions are plotted in Figure 1. Figure 1a shows that the relationship between coercive power and trustworthiness is moder-

TABLE 2

Moderated Multiple Regression Analysis: Regression of Quality of Relationship on Power Bases

Step *Variable*	*b*	*B*	*F*	R^2	ΔR^2
I. Main effects				0.68437**	0.68437**
REF	0.50258	0.45564	71.16**		
COER	−0.14309	−0.16745	20.40**		
EXP	0.26029	0.24293	26.81**		
LEG	0.06059	0.04291	1.08		
REW	0.13335	0.09868	4.33*		
II. Two-way interactions				0.69023	0.00586

NOTE: Intercept = −0.510316. *b*: Unstandardized regression coefficient; *B*: Standardized regression coefficient. *REF*: Referent power; *COER*: Coercive power; *EXP*: Expert power; *LEG*: Legitimate power; *REW*: Reward power.
$^{**}p < 0.01$. $^{*}p < 0.05$.

TABLE 3

Moderated Multiple Regression Analysis: Regression of Trustworthiness on Power Bases

Step *Variable*	*b*	*B*	*F*	R^2	ΔR^2
I. Main effects				0.53734**	0.53734**
REF	0.13242	0.12766	0.88		
COER	−0.40206	−0.50034	25.10**		
EXP	0.20538	0.20384	5.34*		
LEG	−0.02088	−0.01573	0.07		
REW	0.02846	0.02240	0.03		
II. Two-way interactions				0.57557**	0.03823**
REF X COER	0.05254	0.40451	14.56**		
REF X EXP	0.02325	0.15196	1.50		
REF X LEG	−0.01280	−0.08435	0.35		
REF X REW	0.01472	0.08305	0.51		
COER X EXP	−0.00776	−0.06293	0.40		
COER X LEG	−0.03159	−0.24937	4.65*		
COER X REW	−0.00205	−0.01358	0.01		
EXP X LEG	−0.00846	−0.05590	0.21		
EXP X REW	0.00388	0.02244	0.04		
LEG X REW	−0.01453	−0.08174	0.64		

NOTE: Intercept = 1.573438. *b*: Unstandardized regression coefficient; *B*: Standardized regression coefficient. *REF*: Referent power; *COER*: Coercive power; *EXP*: Expert power; *LEG*: Legitimate power; *REW*: Reward power.
**$p < 0.01$. *$p < 0.05$.

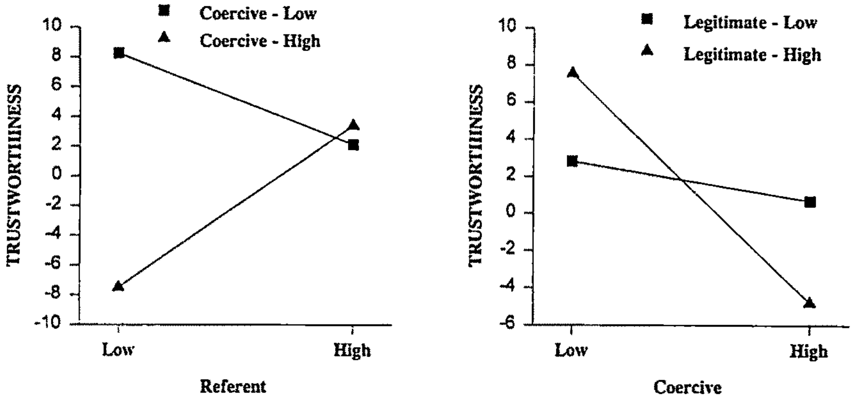
TABLE 4

Moderated Multiple Regression Analysis: Regression of Credibility on Power Bases

Step *Variable*	*b*	*B*	*F*	R^2	ΔR^2
I. Main effects				0.60911**	0.60911**
REF	0.38806	0.39333	42.53**		
COER	−0.14086	−0.18429	19.82**		
EXP	0.23515	0.24536	21.94**		
LEG	0.11426	0.09046	3.86		
REW	0.06986	0.05779	1.19		
II. Two-way interactions				0.63260**	0.02349

NOTE: Intercept = 1.462838. *b*: Unstandardized regression coefficient; *B*: Standardized regression coefficient. *REF*: Referent power; *COER*: Coercive power; *EXP*: Expert power; *LEG*: Legitimate power; *REW*: Reward power.
**$p < 0.01$. *$p < 0.05$.

ated by referent power. More specifically, when referent power is high, there is no difference between high and low coercive ratings on trustworthiness. However, note that when referent power is low, there is a noticeable difference between low and high coercive power, such that



a. REFERENT BY COERCIVE b. COERCIVE BY LEGITIMATE

FIG. 1. Interactive Effects of Power Bases on Trustworthiness

low coercive power is associated with higher trustworthiness ratings than high coercive power. Figure 1b shows the Coercive by Legitimate interaction. At the level of high coercive power, trustworthiness ratings are generally low, but they are lower for high legitimate than low legitimate power. On the other hand, at levels of low coercive power trustworthiness ratings are generally higher, and a supervisor with high legitimate power is seen as more trustworthy than a supervisor with low legitimate power.

Main effects. Table 3 shows that, overall and averaging across values of the other power bases, expert and coercive ratings were positively and negatively associated with trustworthiness, respectively. The standardized regression coefficients indicate that coercive power was very strongly and negatively associated with trustworthiness (i.e., $B = -0.50$).

Taken together, regressing trustworthiness ratings on the main and interactive effects of the five power bases indicates that coercive power is associated with low trustworthiness and expert power is associated with high trustworthiness. In addition, the interaction effects suggest that high ratings on individual power bases do not fully explain trustworthiness ratings. More specifically, the negative impact of coercive power is even stronger when it is accompanied with (a) high legitimate power as compared to low legitimate power, and (b) low referent power as compared to high referent power.

3. *Professor's credibility.* Table 4 shows the results of regressing credibility ratings on the five power bases scores. Referent and expert power were positively associated with credibility ratings. Interestingly, high

coercive power was associated with low credibility. The main effects of the five power bases accounted for about 61% of the variance in credibility ratings. No interactive effects were found among the power bases.

Students' intentions. Tables 5-7 show the results of regressing students' intentions regarding (1) inviting the supervising professor to serve on a dissertation or thesis committee, (2) inviting the supervising professor to chair a dissertation or thesis committee, and (3) submitting papers together with supervising professor to conferences or journals on the main and interactive effects of the five power bases.

1. *Intention to invite professor to serve on dissertation or thesis*

TABLE 5

Moderated Multiple Regression Analysis: Regression of Intention to Invite Supervisor to Serve on Dissertation or Thesis Committee on Power Bases

Step *Variable*	*b*	*B*	*F*	R^2	ΔR^2
I. Main effects				0.14276**	0.14276**
REF	−0.39351	−0.21359	5.44*		
COER	−0.25129	−0.17606	7.85**		
EXP	0.53275	0.29769	14.02**		
LEG	−0.03358	−0.01424	0.04		
REW	0.38691	0.17141	4.54*		
II. Two-way interactions				0.18414**	0.04138

NOTE: Intercept = 1.061471. *b*: Unstandardized regression coefficient; *B*: Standardized regression coefficient. *REF*: Referent power; *COER*: Coercive power; *EXP*: Expert power; *LEG*: Legitimate power; *REW*: Reward power.
$^{**}p < 0.01$. $^{*}p < 0.05$.

TABLE 6

Moderated Multiple Regression Analysis: Regression of Intention to Invite Supervisor to Chair Dissertation or Thesis Committee on Power Bases

Step *Variable*	*b*	*B*	*F*	R^2	ΔR^2
I. Main effects				0.08213**	0.08213**
REF	−0.22056	−0.11255	1.43		
COER	−0.23723	−0.15627	5.84*		
EXP	0.36528	0.19189	5.50*		
LEG	−0.02480	−0.00989	0.02		
REW	0.27268	0.11358	1.88		
II. Two-way interactions				0.12630**	0.04417

NOTE: Intercept = 0.018072. *b*: Unstandardized regression coefficient; *B*: Standardized regression coefficient. *REF*: Referent power; *COER*: Coercive power; *EXP*: Expert power; *LEG*: Legitimate power; *REW*: Reward power.
$^{**}p < 0.01$. $^{*}p < 0.05$.

TABLE 7

Moderated Multiple Regression Analysis: Regression of Intention to Submit Papers with Supervisor to Conferences or Journals on Power Bases

Step *Variable*	*b*	*B*	*F*	R^2	ΔR^2
I. Main effects				0.03931*	0.03931*
REF	−0.01718	−0.05209	0.30		
COER	0.00152	0.00595	0.01		
EXP	0.05410	0.16891	4.22*		
LEG	−0.00477	−0.01130	0.02		
REW	0.03897	0.09647	1.34		
II. Two-way interactions				0.05629	0.01698

NOTE: Intercept = 0.511923. *b*: Unstandardized regression coefficient; *B*: Standardized regression coefficient. *REF*: Referent power; *COER*: Coercive power; *EXP*: Expert power; *LEG*: Legitimate power; *REW*: Reward power.
**$p < 0.01$. *$p < 0.05$.

committee. Fourteen percent of the variability in this criterion variable was accounted for by the main effects of the power bases (see Table 5). Also, the standardized regression coefficient associated with expert power was the largest and positively associated with the intention to invite the supervisor to serve on the committee. Coercive and referent power ratings were negatively associated, and reward power ratings were positively associated with this criterion variable.

2. *Intention to invite professor to chair dissertation or thesis committee.* The relationship between power bases and intention to invite a supervisor to *serve* on the committee is not the same as that between the power bases and intentions to invite a supervisor to chair it. Table 6 indicates that (1) only about 8% of variance in this criterion variable is explained by power bases ratings, and (2) expert power has a positive relationship and coercive power has a negative relationship with this intention.

3. *Intention to coauthor conference or journal manuscripts with professor.* The relationship between power bases ratings and this criterion variable was weak, with only a 4% variance overlap (see Table 7). Expert power was the only power base associated with this intention: expert power ratings are positively associated with intentions to engage in this type of collaborative work with the supervisor.

Students' behaviors. Tables 8–10 show MMR results of regressing (1) number of publications coauthored with supervisor, (2) number of papers coauthored with supervisor presented at conferences, and (3) compliance with supervisors' requests on the five power bases.

1. *Number of publications coauthored with supervisor.* Power bases

TABLE 8

Moderated Multiple Regression Analysis: Regression of Number of Publications on Power Bases

Step *Variable*	b	B	F	R^2	ΔR^2
I. Main effects				0.02505	0.02505
REF	−0.03295	−0.11700	1.49		
COER	−0.00168	−0.00768	0.01		
EXP	0.02275	0.02831	0.12		
LEG	−0.02913	−0.08080	0.27		
REW	0.06967	0.20194	5.76*		

NOTE: Intercept = 0.399439. b: Unstandardized regression coefficient; B: Standardized regression coefficient. *REF*: Referent power; *COER*: Coercive power; *EXP*: Expert power; *LEG*: Legitimate power; *REW*: Reward power.
$^{**}p < 0.01$. $^{*}p < 0.05$.

TABLE 9

Moderated Multiple Regression Analysis: Regression of Number of Papers Presented at Professional Conferences on Power Bases

Step *Variable*	b	B	F	R^2	ΔR^2
I. Main effects				0.02556	0.02556
REF	−0.06116	−0.12384	1.68		
COER	0.02455	0.06415	0.96		
EXP	0.05532	0.11531	1.93		
LEG	−0.01852	−0.02929	0.16		
REW	0.08641	0.14280	2.89		

NOTE: Intercept = 0.447336. b: Unstandardized regression coefficient; B: Standardized regression coefficient. *REF*: Referent power; *COER*: Coercive power; *EXP*: Expert power; *LEG*: Legitimate power; *REW*: Reward power. None of the regression coefficients was significant at the $p < 0.05$ level.

ratings only accounted for 2.5% of the variance in this reported behavior ($p > 0.05$) (see Table 8). Reward was the only power base found to be related (positively) to number of publications coauthored by students and their supervisors ($p < 0.05$).

2. *Number of conference papers coauthored with supervisor.* Table 9 shows results comparable in nature to Table 8, but statistical significance was not reached for the effects of any of the power bases. Students' reports of number of papers presented at conferences do not seem to be related to power ratings.

3. *Compliance with supervisors' requests.* Table 10 includes the MMR results of regressing compliance on the main and interactive effects of the power bases. The second-order interactive effects of the power bases accounted for approximately 6% of the variance in com-

TABLE 10

Moderated Multiple Regression Analysis: Regression of Compliance on Power Bases

Step *Variable*	*b*	*B*	*F*	R^2	ΔR^2
I. Main effects				0.50219**	0.50219**
REF	0.01810	0.02105	2.41		
COER	−0.05449	−0.08178	0.65		
EXP	0.32737	0.39180	19.25**		
LEG	0.43906	0.39870	45.35**		
REW	0.25008	0.23730	0.91		
II. Two-way interactions				0.56008**	0.05789**
REF X COER	−0.01794	−0.16656	2.41		
REF X EXP	−0.01515	−0.11943	0.91		
REF X LEG	−0.00259	−0.02059	0.02		
REF X REW	0.05081	0.34569	8.61**		
COER X EXP	−0.00595	−0.05813	0.33		
COER X LEG	0.03756	0.35749	9.32**		
COER X REW	0.00011	0.00085	0.00		
EXP X LEG	0.00074	0.00593	0.02		
EXP X REW	−0.03167	−0.22046	3.51		
LEG X REW	−0.02762	−0.18741	1.12		

NOTE: Intercept = 0.789897. *b*: Unstandardized regression coefficient; *B*: Standardized regression coefficient. *REF*: Referent power; *COER*: Coercive power; *EXP*: Expert power; *LEG*: Legitimate power; *REW*: Reward power.

$^{**}p < 0.01$. $^{*}p < 0.05$.

pliance above and beyond their main effects. The two-way interactions are described next, followed by the main effects.

Two-way interactions. Figure 2 illustrates the nature of the two-way interactive effects of the power bases on compliance. Plotting the Referent by Reward interaction (Figure 2a) indicates that the relationship between reward power and compliance is moderated by referent power ratings. More specifically, reward power has a strong and positive relationship with compliance when referent power is high. However, this positive relationship between reward power and compliance is mitigated in situations of low referent power. A perusal of Figure 2b, which displays the Coercive by Legitimate interaction, shows that the impact of legitimate power on compliance ratings is contingent on coercive power ratings. High legitimate power ratings increase compliance as compared to low legitimate power when coercive is high. However, at low levels of coercive power, high versus low legitimate power ratings do not affect compliance.

Main effects. Table 10 shows that expert and legitimate power ratings had a positive, and similar in magnitude, effect on compliance.

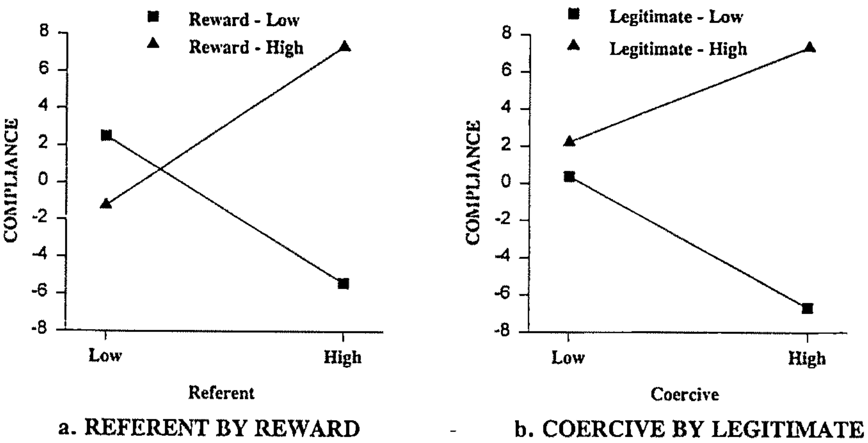


FIG. 2. Interactive Effects of Power Bases on Compliance

Moreover, the standardized regression coefficients for these two predictors are virtually identical.

Taken together, results of regressing compliance ratings on the main and interactive effects of the five power bases indicate that expert power and legitimate power are positively associated with compliance. In addition, the interactive effects indicate that (a) the impact of reward power decreases as referent power ratings increase, and (b) the positive effect of legitimate power is diminished when coercive power ratings increase.

Discussion

The present study extended previous research on power in supervising professor-student relationships in graduate education in three ways: (1) we used a theory of power to define precisely the term and its components, (2) we used measurement instruments with demonstrated psychometric properties (i.e., construct validity and reliability) to measure the various power bases, and (3) we systematically investigated relationships between supervisors' power and students' reports of their perceptions, intentions, and behaviors.

Extending previous work found in the graduate student socialization and development literatures regarding the importance of faculty-student interrelationship and interactions [for example, 30, 11, 60], the results of this study show that graduate students' perceptions of their supervising professors' *power* are related to a number of variables critical to student satisfaction and success. More specifically, this study's results show that graduate students' perceptions of their supervisors' power are strongly associated with (1) perceptions of quality of the professor-student relationship, (2) perceptions of supervisors' trustworthiness, (3) perceptions of supervisors' credibility, and (4) students' reports of compliance with supervisors' requests. In addition, students' perceptions of their supervisors' power are moderately related to (1) intention to invite a supervisor to serve on dissertation or thesis committee, and (2) intention to invite a supervisor to chair dissertation or thesis committee. Lastly, power perceptions are weakly associated with intention to submit papers with a supervisor to journals or conferences.

Specific Relationships between Power Bases and Outcome Variables

An examination of the individual relationships between the power bases and their correlates indicates the following relationships:

1. *Expert power* is positively associated with perceptions of quality of the relationship, a supervisor's trustworthiness, a supervisor's credibility, intention to invite a supervisor to serve and chair a dissertation or thesis committee, and intentions to engage in collaborative research with a supervisor.

2. *Reward power* is associated with a good perceived quality relationship, intention to invite a supervisor to serve on a dissertation or thesis committee, and number of publications coauthored with a supervisor.

3. *Legitimate power* is associated with trustworthiness and compliance through interactive effects. When supervising professors are perceived as having high coercive power, high legitimate power is associated with lower trustworthiness ratings than low legitimate power. On the other hand, at levels of low coercive power a supervisor with high legitimate power is seen as more trustworthy than a supervisor with low legitimate power. Thus, a faculty supervisor is not seen as trustworthy when he or she has coercive power, and this perception of untrustworthiness is even stronger when a supervisor not only has the ability to punish a student but can also use this ability legitimately.

The impact of legitimate power on compliance ratings is contingent on coercive power ratings. A supervisor perceived as having high legitimate power elicits more compliance than a supervisor with low legitimate power when coercive power ratings are high. However, at low levels of coercive power, differences in perceived legitimate power ratings do not affect compliance. Thus, when the faculty supervisor is perceived as not having high coercive power, legitimate power is not strongly associated with compliance. However, the combination of high legitimate power and high coercive power is associated with the highest compliance ratings.

4. *Referent power* is related to trustworthiness and compliance through interactive effects. When referent power is high, differences in coercive power do not affect perceptions of trustworthiness. However, when referent power is low, low coercive power is associated with higher trustworthiness ratings than is high coercive power. Thus, when a faculty member has power over the student because of a student's desire to be associated or identified with a professor, presence or absence of coercive power does not affect perceptions of trustworthiness. However, when a professor does not have much referent power, the perceptions of high coercive power decreases perceptions of trustworthiness noticeably.

Reward power has a strong and positive relationship with compliance when referent power is high. However, this positive relationship between reward power and compliance is mitigated in situations of low referent power. Students report the highest compliance levels when a professor is not only perceived as being able to provide them with rewards (high reward power) but is also perceived as making a student feel valued, personally accepted, approved, and important (high referent power).

5. The greater the perceived *coercive power* of faculty supervisors, the more likely students were to report negative outcomes such as poor-quality professor-student relationships, perceptions of a supervisor's untrustworthiness and low credibility, and intentions not to invite this supervising professor to chair and serve on a dissertation or thesis committee.

Implications for Theory and Policy

The results pertaining to the individual effects of the power bases are consequential for theory and policy in higher education. First, graduate education is frequently portrayed as an intimate relationship between a supervising professor and a student, and the socialization and development of graduate students is known to depend largely on this relationship [30, 51]. The present research demonstrates the importance of the *power relationship* between faculty and students. We found that this relationship plays a critical role in student-faculty relationships and interactions. For example, if a supervising professor is seen as an expert, this affects students' perceptions of him or her as being trustworthy and credible, perceptions of the overall quality of the student-faculty relationship, and students' desire to invite the supervisor to be on a dissertation or thesis committee and to collaborate in research-related activities. Alternatively, if a supervising faculty member is perceived as having coercive power, students perceive her or him as not being credible or trustworthy and therefore do not intend to invite him or her to serve on a thesis or dissertation committee. Consequently, the power relationship between students and faculty members can have a profound impact on students' experiences in graduate school and their research productivity.

The results of this study also have direct implications for faculty. Hartnett and Katz [30] argued that faculty need graduate students to collaborate with their research and that faculty often need students more than students need faculty. In light of this need and the well-known pressures to be productive as dictated by "publish or perish" policies, our results provide suggestions regarding the individual identities that professors need to present in order to develop positive relationships with graduate students and recruit research collaborators. If a faculty member desires to serve as chair on theses and dissertation committees and to carry out collaborative research, he or she needs to be concerned with displaying expertise and avoid any appearance of possessing significant coercive power. Clearly, students enjoy their relationships with a supervising professor who has high expert power more than with one who has low expert power.

The negative association of coercive power with educational outcomes of graduate student assistants also has important implications. Universities are typically described in terms of intellect and universal values and appeal to reason as the basis of decision making. Expertise and competence are the criteria for employing, retaining, and promoting faculty members. Professors who resort to coercion to obtain compliance from students may be perceived as illegitimate and, consequently, students display psychological reactance. Graduate students attempt to avoid or dissociate from faculty who are perceived to possess coercive power in favor of those who have bases of power more consistent with the values perceived as relevant to a university.

Finally, an additional issue of theoretical importance refers to the interactive effects. The statistically significant interactive effects show that the perceptions of the power bases form complex patterns, which in turn are related to at least two constructs (perceptions of faculty trustworthiness and student compliance) that are undoubtedly relevant for social relationships in graduate education and other organizational settings. These interactive effects, together with the results reported by Aguinis, Nesler, Quigley, and Tedeschi [3], suggest the existence of contingency mental models that link power bases perceptions with other constructs, perhaps in implicit ways. These mental models are cognitive systems of interrelated symbols that guide and simplify processing of social perceptions (see [3] for an application of a cognitive theory to the study of power perceptions). That is, specific patterns of combinations of power bases are associated with high or low perceptions of trustworthiness and compliance. Consequently, the *interactive* effects of the power bases reported here and, to our knowledge not yet investigated elsewhere, suggest a new theoretical avenue for the study of power that includes not only the main effects of power bases, but also their interactions.

Limitations and Suggestions for Future Research

We should acknowledge that throughout this article we have used terms such as "the effect of . . . on . . ." despite the fact that we conducted a passive observation study and, therefore, the data do not strictly allow for the attribution of causal relationships [17]. However, despite the fact that our study was based on a passive observation design, we had a priori, theory-based hypotheses regarding the direction of the anticipated relationships. Several authors [for example, 56, 70] have theoretically predicted the same causal direction from power bases to various outcomes that we have tested in this study. Future research utilizing experimental designs should address the causality issue and replicate our findings in the context of a controlled setting. One suggestion for conducting this type of experimental research is that students in a laboratory setting be presented with written descriptions of various faculty profiles in which the power bases are manipulated. Then, students may be asked to answer questions regarding the same outcome variables that we measured in the present study (e.g., faculty credibility, faculty trustworthiness). However, conducting this type of experimental research is not without criticisms. The delineation of causal directions is gained at the expense of an experimental situation that may not realistically represent faculty-student interactions.

It should be noted that although the predictive ability of the power bases was clearly realized regarding perceptions and some intentions, the proportion of variance accounted for in reports of behaviors was smaller. This finding does not necessarily mean that the power of faculty, as perceived by students, does not predict behavior. More specifically, Table 1 shows that the mean number of publications in the sample is 0.41, the mean number of conference papers is 0.67, and the mean rating regarding intention to submit papers to conferences or journals is 0.84. These means were accompanied by extremely small standard deviations, $SD = 1.10$ for publications, $SD = 1.92$ for conference papers, and $SD = 1.28$ for intentions to submit papers. Recent computer simulation work on the ability of MMR to detect interaction effects has uncovered that small variability in the predictor and criterion variables inevitably leads to the underestimation of population effects [1, 6]. Thus, given that the variability of these three reported variables was noticeably smaller than that of the other variables measured (see Table 1), the effects of the power bases on the reports of these were most likely underestimated. Accordingly, future research should address this issue and test whether the weak, although statistically significant, relationship between the power bases and the research productivity-related reports found in the present study was due to an underestimation of population effects. This could be achieved by collecting data in a sample in which students present more variability regarding research productivity than in the present sample.

In the present study we did not differentiate teaching assistants from research assistants. An anonymous reviewer suggested that the nature of the research and teaching assistant jobs differ and that, consequently, their relationships with faculty supervisors may differ as well. The results suggest definite relationships between faculty power and graduate assistants in general; however, future research should address whether there are differences regarding the effects of faculty power bases on these two groups. For example, faculty supervising research assistantships may have higher reward power than faculty supervising students in teaching assistantship duties, because they may have the ability to provide students with summer support and laboratory space.

We believe the present results give rise to several additional avenues for research on power in graduate professor-student relationships. Now that we know of the existence of consistent patterns of interactive relationships among the power bases on trustworthiness and compliance, future research should attempt to delineate possible mental models regarding these relationships in a more precise manner [cf. 1]. This could be achieved by utilizing readily available methodologies such as neural networks [32, 64]. Adopting this approach would allow researchers to account for the formation and maintenance of cognitive models regarding the possibly dynamic relationships among the power bases and other related constructs.

Finally, in this study we chose to investigate professor-student power relationships in a unilateral manner. We did not measure students' perceptions of their own power, which past research has shown to be low

[38], nor did we assess supervisors' perceptions of their students' power. For example, Brenders [14] suggested that power relationships are relational rather than unilateral. Thus, future research could simultaneously investigate students' and professors' power perceptions.

Concluding Remarks

Graduate faculty are often portrayed as models and mentors of their students [60], and therefore they play a central role in the socialization and development of students [35]. As the agents of this socialization process, professors educate, shape, influence, and direct graduate students. Our study indicated that students' perceptions of faculty power play a critical role in their interactions with supervising professors. In short, the present research demonstrated that the power bases are important antecedents of several variables critical to graduate students' experiences, satisfaction, and success.

Notes

[1] Tables detailing the sample's demographic characteristics can be obtained by contacting the senior author.

Appendix A

Instructions Read by Participants

This survey consists of a list of statements which may be used in describing the relationship between professors (supervisors in assistantship duties) and their graduate students. First carefully read each descriptive statement, thinking in terms of your supervisor in your assistantship duties. Then decide to what extent you agree with each of the statements. Please read each statement carefully and *circle* the number which most closely represents what you feel. If you work with more than one supervisor, choose the one with whom you spend more time.

In responding to the items, circle the number that best represents what you feel.

Likert-type Scale Utilized

−9	−8	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	8	9
STRONGLY DISAGREE			MODERATELY DISAGREE			SLIGHTLY DISAGREE			NEITHER		SLIGHTLY AGREE				MODERATELY AGREE		STRONGLY AGREE	

Appendix B

Scale Items

MY SUPERVISOR . . .

(Coercive Power)

can make my work difficult for me.

can make things unpleasant here.

can make being at the lab/office distasteful.
can give me undesirable assistantship-related assignments.
(Expert Power)
can share with me her/his considerable experience and/or training.
can give me good technical suggestions.
can provide me with needed technical knowledge.
can provide me with sound advice related to our field of study.
(Legitimate Power)
can make me feel that I have commitments to meet.
can make me feel like I should satisfy my assistantship requirements.
can give me the feeling that I have responsibilities to fulfill.
can make me recognize that I have tasks to accomplish.
(Referent Power)
can make me feel valued.
can make me feel like (s)he approves of me.
can make me feel personally accepted.
can make me feel important.
(Reward Power)
can give me extra time off.
can write a strong letter of recommendation on my behalf.
can provide me with special benefits.
can make my work week easier.
(Trustworthiness)
tends to take my ideas as her/his own. (R)
manipulates me for her/his own ends. (R)
gives me tasks to do which are not related to my graduate training. (R)
is a manipulative person. (R)
would not have me work on a project without giving me credit for it.
(Credibility)
is a person who keeps her/his word.
does what (s)he says (s)he will do.
tells the truth.
makes accurate statements of fact to me.
is accurate in her/his statements to me.
is honest.
(Compliance)
is someone with whose directives I comply.
is someone whose suggestions I follow.

NOTE: (R) indicates that item responses were reflected.

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War Attitudes and Ideological Orientations of Honors Directors in American Higher Education

The ideological orientations of college professors in different eras have attracted past commentary and study, because academics are presumed to have influence in helping to shape public opinion through their research, writing, advisory, and consulting roles, and especially through their direct contact with students who are being prepared to pursue a variety of specialized careers essential to the continued functioning of contemporary society. Previous studies of the political values of college professors indicate that, as a whole, academics are more liberal than conservative in their political views and that, within the academy, faculty in social science and humanities disciplines are typically more liberal than their counterparts in other academic fields [3, 6, 18, 19, 20, 34]. Furthermore, during times of international conflict and war, academics often have become prominent dissenters from government military policies. This was particularly true during the United States' prolonged military involvement in Vietnam [1, 2, 33, 36]. The relative liberalism of academics (especially those who see themselves as intellectuals rather than technical experts) may in part be attributed to the nature of their training and the expectations of their disciplines, which typically place a premium on questioning, innovation, and the critical analysis of conventional forms of thought and practice [14, 21, 27, 33].

One understudied but academically important segment of the American professoriate consists of those individuals who have been drawn to

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active involvement and leadership in the formation and guidance of honors curricula. Surprisingly little empirical research has been published in the social science literature that focuses on honors faculty or their students in honors programs. Thus, for example, in Pascarella's and Terenzini's [28] massive review of research on how college affects students, we found no references at all to the characteristics of honors programs in American higher education. Because honors programs ostensibly function to select out and educate students from the brightest segment of the undergraduate population, the cultural and ideological perspectives of those in charge of such programs are potentially important, not just in training some of the country's best students in critical thinking, but in the political socialization of these students as well.

Like chairs of academic departments, most honors directors are faculty members who have assumed certain administrative responsibilities but continue to teach and do academic research. Whereas other college faculty are recruited to teach honors courses on an ad hoc basis, directors (and occasionally assistant directors in larger programs) teach many of the required honors courses, are responsible for developing the honors curriculum, and typically spend more time than anyone else in advising and mentoring honors students outside of class. If we want to make generalizations about the political characteristics of honors faculty, we would argue that honors directors in particular represent the single most important and influential set of individuals to be surveyed.

Thus, in this article we attempt to characterize some of the political orientations of honors directors throughout the United States, especially their attitudes toward U.S. military involvement in the two major American wars of the last thirty years: Vietnam and the Persian Gulf. Our present focus on honors directors is an extension of previous studies in which we have reported and analyzed the war attitudes and associated political orientations of the current American professoriate as a whole [30, 31].

On 15 January 1991 we sent a mailed questionnaire to both a national random sample of university professors, and all directors of honors colleges and/or honors programs affiliated nationwide with the National Collegiate Honors Council, soliciting their political reactions to the deployment of U.S military forces to the Persian Gulf and the impending war with Iraq. Coincidentally, the bombing of Baghdad and other targets in Iraq commenced the following day. In contrast to strong public support of military action reported by the press and national opinion polls in the U.S. [4, 13], our survey indicated that American college professors as a whole were more divided and ambivalent in their support of the war effort and, in fact, were much more inclined to express a fair amount of dissent. Among other things, we found that academic dissent from military policy in the Persian Gulf was correlated quite strongly with previous faculty opposition to the war in Vietnam. Consistent with the political indications of earlier studies, our data also showed that relative support for (or opposition to) both the Vietnam and Persian Gulf Wars varied by academic discipline. Thus, humanities and social science faculty were, on average, significantly more liberal in their political views and more critical of U.S. military actions than were faculty in other disciplines.

As a small but educationally influential component of the professoriate, what were the reactions of honors directors to these same international conflicts? What are the general political orientations of honors directors in American higher education? Our initial orienting hypothesis in pursuing these questions was based on the assumption that the majority of honors directors would consist of faculty with advanced degrees in humanities or social science disciplines, and that therefore, as a group, they would hold relatively liberal political views and express a fair amount of opposition to U.S. military actions in both Vietnam and the Persian Gulf. As an extension of our previous research on the political correlates of age in academia, we also wanted to determine to what extent, if any, the political attitudes of honors directors varied as a function of different age cohorts in academia. In particular we wanted to know what proportion of current honors directors had themselves been college students during the Vietnam war and measure the extent to which their student attitudes regarding that war were correlated with their later reactions to U.S. military intervention in the Persian gulf. The relative position of honors directors on these and related political questions can be clarified by comparing their responses to those of other academics surveyed in our national faculty sample.

Samples

As described in earlier reports, we utilized the *1991 National Faculty Directory* as a sampling frame for the national professoriate. The *National Faculty Directory* is published annually by Gale Research Inc. and contains the names and academic department addresses of approximately six hundred thousand faculty who teach at institutions of higher education throughout the United States and Canada [26]. We excluded from consideration Canadian faculty and those teaching at two-year colleges in order to concentrate our attention on faculty working at major degree-granting institutions of higher education in the United States. We then obtained from CMG Information Services, the firm which produces names and addresses for the *Directory,* a computer-generated random sample of 1300 university professors who were teaching at four-year institutions in every region of the United States. Faculty selected in our sample were sent questionnaires on 15 January 1991, and subsequently reminder notices were sent on 28 January and again on 25 February to those who had not responded. Ultimately a total of 657 completed questionnaires were returned to us, yielding a response rate of 51 percent. Demographic characteristics of the sample were very similar to statistical profiles of the American Professoriate compiled by the Carnegie Foundation and the National Center for Education Statistics [5, 24, 25, 30]. At the same time, the names and addresses of 223 honors directors were obtained from a mailing list provided by the National Collegiate Honors Council. Questionnaires and reminder notices were mailed on the same days as those to the national faculty sample were mailed. A total of 173 honors directors responded to the survey for a response rate of 78 percent. It should be noted that 94 percent of the honors directors who responded indicated that they were actively involved in teaching as well as administering honors programs at their institutions.

Thus, in this study we will compare the political responses of 173 honors directors, representing a large majority of the honors programs currently instituted throughout the United States, to a random sample of 657 other college professors, representing the national professoriate as a whole.

Measurement of Dependent Variables

Using 5-point Likert-scale items from our questionnaire, we constructed a set of indexes to measure respondents' overall reactions to both the Persian Gulf and Vietnam Wars. Some survey questions measured degree of support for U.S. intervention and aggressive military solutions to the conflicts, whereas others measured degree of support for de-escalation or withdrawal of U.S. military forces. Although they are logical opposites conceptually, aggressive and withdrawal attitudes (which we labeled as "Hawk" and "Dove" attitudes respectively) cannot simply be assumed empirically to represent redundant alternatives for describing peoples' political orientations. Thus, when we correlated our respondents' overall IRAQHAWK scores with their overall IRAQDOVE scores, we obtained a relatively strong, but less than perfect, inverse correlation of −0.81. Measures of respondents' Hawk attitudes are good predictors of their Dove attitudes and vice versa, but they are not identical values. Throughout the data analysis in this study we will employ both Hawk and Dove indexes as related but separate indicators of faculty war attitudes. [For a description of particular index items and validation measures connected with HAWK, DOVE, and other indicators used in this study, see 30, 31.]

Opinions on questionnaire statements about the Vietnam War also were measured by 5-point Likert scale items, but for two different points in time. Recollection questions are always potentially problematic, but such polarizing issues as the Vietnam War are likely to leave quite vivid impressions for most people, even after the lengthy passage of time. First, respondents were asked to recollect their past views: "Thinking back to about 1970 in the Vietnam War, what were your opinions *then,* as accurately as you can recall, on the following issues?" A set of statements about the war then followed with which respondents could indicate their degree of agreement or disagreement. Only 10 percent of the national sample reported that they were too young in 1970 to remember having definite opinions about the war, whereas a mere 3 percent of honors directors said they could not remember. Subsequently, respondents were asked to indicate their retrospective views of the war in 1990: "Looking back at America's political and military policies during the Vietnam War, what would be your opinions on these same issues *today?,*" following which they indicated their current agreement or disagreement with the same set of statements. On a scale of 1.0 to 5.0, VIETHAWK scores summarized the extent to which respondents supported U.S. military policies in Vietnam, whereas VIETDOVE items measured degree of support for the withdrawal of U.S. military forces from Vietnam.

As with attitudes toward the Persian Gulf War, we obtained relatively strong, but less than perfect, inverse correlations of −0.72 between VIETHAWK70 and VIETDOVE70 and −0.69 between VIETHAWK90 and VIETDOVE90. At the same time, positive correlations of 0.83 between VIETHAWK70 and VIETHAWK90 and 0.82 between VIETDOVE70 and VIETDOVE90 indicated the overall degree of continuity as well as change in respondents' attitudes toward the Vietnam War over a twenty-year period.

Finally, in addition to measuring Hawk and Dove orientations, we also created two protest indexes, which indicated the extent to which respondents either considered or, in fact, engaged in active dissent from government war policies. VIETPROTEST was constructed by asking: "In the *1960s or 70s* did you ever participate in: (1) Legal demonstrations (such as public rallies or marches) in protest of the Vietnam War? (2) Did you ever participate in demonstrations of civil disobedience (such as sit-ins or draft card burnings) in protest of the Vietnam War?"

Response categories to both questions were: "No," "Yes, at least once," "Yes, several times," "Yes, many times." Thus, VIETPROTEST was an actual behavioral indicator. Similarly, GULFPROTEST was constructed by asking: "Would you participate *today* in: (1) Legal protest demonstrations against the deployment of U.S. troops to Saudi Arabia? (2) Would you participate in demonstrations of civil disobedience to protest the deployment of U.S. troops to Saudi Arabia?" Response categories to both questions were: "No, definitely not," "Don't know," "Perhaps, with reservations," "Yes, definitely." Unlike VIETPROTEST, GULFPROTEST was only an attitudinal measure rather than a behavioral indicator. Both VIETPROTEST and GULFPROTEST index values ranged from a possible low of 0.0 (respondent indicated neither legal demonstrations nor civil disobedience) to a possible high of 9.0 (respondent indicated "many times" and "definitely" to both legal demonstrations and acts of civil disobedience).

War Attitudes and Ideological Orientations of Honors Directors Compared to the National Faculty as a Whole

Mean HAWK and DOVE index comparisons presented in Table 1 show that honors directors were systematically less hawkish and more dovish than other faculty on *all* Vietnam and Gulf War attitude measures. Thus, while current faculty as a whole typically opposed the Vietnam War in 1970, current honors directors were, on average, even more opposed to the war at that time. By 1990, retrospective support for U.S. involvement in Vietnam had declined even further among both honors and nonhonors comparison groups, but a statistically significant difference persisted between them. In general, faculty who are now honors directors were not only less supportive of the Vietnam War in 1970 than were other current faculty but, retrospectively, they continued to be less supportive of that war in 1990 as well.

A similar pattern of honors versus nonhonors differences was evident when comparing faculty reactions to the more recent Persian Gulf War. For both categories of faculty, opposition to U.S. military action in the Persian Gulf never developed to the same extent that their opposition to the Vietnam War did. On the other hand, our IRAQHAWK and IRAQDOVE measures did not demonstrate much enthusiastic support for the war either. But our data did show that honors directors' hawkishness in favor of military measures against Iraq was significantly weaker in comparison to the war views of other faculty and that, correspondingly, their dovish attitudes against escalation of the conflict were significantly stronger.

TABLE 1

Analysis of Variance: Vietnam, Persian Gulf, and Ideology Index Means by Type of Faculty

	Honors Directors ($N = 173$)	National Faculty Sample ($N = 657$)	F	sig.
VIETHAWK70	2.22	2.47	6.31	0.012
VIETHAWK90	2.00	2.29	9.67	0.002
VIETDOVE70	4.21	3.91	15.79	0.0001
VIETDOVE90	4.34	3.94	25.33	0.0000
VIETPROTEST	1.66	1.11	11.02	0.0009
IRAQHAWK	2.88	3.36	23.20	0.0000
IRAQDOVE	3.01	2.64	14.48	0.0002
GULFPROTEST	2.75	1.92	13.49	0.0003
IDEOFRESH	3.00	2.98	0.10	0.750
IDEOGRAD	2.38	2.74	15.74	0.0001
IDEONOW	2.56	2.95	20.34	0.0000

NOTE: HAWK and DOVE index scores potentially range in value from 1.00 (strongly oppose) to 5.00 (strongly support). VIETPROTEST and GULFPROTEST scores can range from 0.00 (neither legal nor illegal forms of protest indicated) to 9.00 (both legal and illegal forms of protest indicated). Ideological positions potentially range from 1.0 (radical left) to 6.0 (radical right).

These measures of the relative degree of difference between honors directors' war attitudes and those of the national faculty are reinforced when we look at PROTEST comparisons in Table 1. Our VIETPROTEST index indicates that, in the 1960s and 70s, current honors directors engaged in active protest against the Vietnam War to a significantly greater degree than other faculty members in contemporary academia ($F = 11.02$/sig. = 0.0009). Discriminating between types of protest, the biggest difference between faculty categories was involvement in legal antiwar demonstrations: 62 percent of current honors directors participated in legal protest of the Vietnam War compared to 40 percent of their faculty counterparts in the national professoriate (chi-square = 26.5/sig. = 0.000). As one would expect, rates of civil disobedience were much lower for both groups. Nonetheless, 15 percent of honors directors engaged in at least one act of civil disobedience in protest of the Vietnam War, whereas 11 percent of the national faculty did so. (This latter comparative difference was not statistically significant, with chi-square = 1.9/sig. = 0.171). At the same time, almost one-quarter (24 percent) of current honors directors belonged to a 1960s antiwar organization, compared to 16 percent of the contemporary professoriate who were members of such organizations. (This difference was statistically significant, with chi-square = 5.6/sig. = 0.018.) All of these figures indicate the historically quite remarkable extent to which current academics — but especially honors directors — actively dissented against the policies of their own government during the Vietnam War.

In certain respects these patterns of American academic dissent appear to have been recapitulated in response to the 1990–91 mobilization for war with Iraq in the Persian Gulf. In drawing this inference, however, we need to keep in mind that GULFPROTEST was an attitudinal index rather than a behavioral index. In contrast to VIETPROTEST, GULFPROTEST measured the extent to which respondents said, at the time of our survey in January 1991 that they would be willing to *consider* participating in active protest of the war, not whether they ever did so. Nonetheless, honors directors had a significantly higher GULFPROTEST mean when compared to other faculty in the national sample ($F = 13.49$/sig. = 0.0003). Only 38 percent of the honors directors said that they would definitely *not* consider participating in legal protest against war with Iraq, compared to 55 percent of the national professoriate who so indicated (chi-square = 18.2/sig. = 0.000). And only about half (49 percent) of honors directors definitely ruled out engaging in civil disobedience against the war, compared to two-thirds (68 percent) of the national sample who were unwilling to consider any such action (chi-square = 27.6/sig. = 0.000).

Given the systematic differences in degree between the war attitudes and political dissent reactions of honors directors compared to other faculty of the national professoriate as a whole, we can anticipate the likelihood of other, corresponding ideological differences between these two groups. From the outset of our study we hypothesized that honors directors would be relatively liberal in their political values. As general indicators of faculty ideological orientations we asked respondents to report their typical political views toward both economic and social policy issues at different stages of their academic careers on an ideology scale ranging from 1.0 (radical left) to 6.0 (radical right). We combined our respondents' self-ascribed political positions on economic and social issues to produce three ideology indexes which we labeled IDEOFRESH, IDEOGRAD, and IDEONOW. For all three ideology indexes a score of 3.5 specified a centrist position midway between varying degrees of left-wing and right-wing attitudes.

Table 1 indicates that as college *freshmen,* there were virtually no mean differences in the political views of current honors directors when compared to their national faculty counterparts ($F = 0.10$/sig. = 0.750). At that stage of their academic development, substantial but not overwhelming majorities of both groups reported left-liberal leanings toward both economic and social issues. Thus, both groups received almost identical, moderately leftist ratings on IDEOFRESH. As indicated in Table 2, our data suggest that it was the shift in time from freshman status to graduate school that became significant in the process of political socialization for most respondents in our survey. For both honors directors and national faculty alike we see that, as graduate students, their mean ideological positions moved further toward the political left. However, this shift leftward was significantly more pronounced for current honors directors than it was for other faculty ($F =$ 05.74/sig. = 0.0001). As graduate students, 69 percent of the current national faculty took left-liberal positions on economic issues, and 75 percent were left-liberal in their social views. In comparison, 84 and 91 percent of current honors directors took left-liberal views as graduate students toward economic issues (chi-square = 13.3/sig. = 0.000) and social issues, respectively (chi-square = 16.9 /sig. = 0.000). Finally, IDEONOW measures revealed a tendency for faculty to be drawn back politically toward a more centrist position following their graduate school days. This retrenchment tendency was particularly true for the national faculty sample, whose mean ideological orientations at the time of our survey were virtually identical to what they had been as college freshmen. In contrast, honors directors were significantly more likely to retain liberal economic and social attitudes more congruent with those acquired during their graduate school days ($F = 20.34$/sig. = 0.0000).

To summarize our findings to this point: When compared to the national professoriate as a whole, honors directors were (1) significantly more opposed to both the Vietnam and Persian Gulf Wars, (2) significantly more willing to express personal dissent through protest activities, and (3) significantly more left-liberal in their political views both as graduate students and currently as members of the professoriate.

Academic Discipline, Age Cohort, and Institutional Hypotheses

Two plausible explanations for the political differences between honors directors and other faculty members indicated by our data revolve around the variables of academic discipline and age cohort distributions in academia. When we previously tested these variables for the national professoriate as a whole, academic discipline proved to be a much better predictor of political views than age cohort distinctions. Is this also true for honors directors?

Respondents in both samples of our survey were asked to report the particular discipline in which they received their highest academic degree. A total of 73 different academic specialties were represented, which ultimately we reduced to a set of 5 general areas: science and mathematics, humanities, social science, education, and business. The science and mathematics category consisted of the largest number of specific disciplines, ranging from anatomy to zoology, and included all engineering and medical sciences, as well as all mathematics and computer science fields. Humanities disciplines ranged from art to theater and included all language fields, philosophy, music and religious studies. Social Science disciplines ranged from anthropology to urban studies, and included history and psychology. In business our sample was represented by accounting, advertising, finance and banking, marketing, and management. Finally, subfields of Education included educational administration, home economics, library science, and physical education, as well as any form of primary or secondary education.

Our survey confirms that honors directors come predominantly from academic backgrounds in humanities or the social sciences, representing those disciplines traditionally most congenial to the development of socially critical perspectives in academia. Four-fifths (79 percent) of the honors directors in our study reported that their highest academic degrees were awarded in either humanities or social science fields, compared to approximately half (52 percent) of the national sample who so indicated. A relatively small proportion of honors directors had graduate backgrounds in science or mathematics (12 percent), and only 5 percent and 4 percent had graduate degrees in education and business, respectively. In comparison, over one-quarter (26 percent) of the national faculty sample had advanced degrees in science or mathematics, and 10 percent and 14 percent, respectively, had graduate backgrounds in education and business. (The overall variation between honors directors' academic backgrounds and those of respondents in the national faculty sample was statistically significant, with chi-square = 43.3/sig. = 0.000.)

Scheffe multiple comparison test results shown in Table 2 for both samples combined demonstrate that the political views of faculty with graduate training in either humanities or social science disciplines do, in fact, differ significantly from the views expressed by faculty from all other academic areas classified in this study. Specifically, humanities and social science faculty, when compared to faculty in science/mathematics, education, and business (especially the latter), had significantly lower HAWK scores, correspondingly higher DOVE and PROTEST scores, and were significantly more left-liberal at both the graduate and current stages of their academic careers.

If, as hypothesized, the war attitudes and ideological orientations of honors directors differ on average from the views of other faculty in our national sample as a result of their predominantly humanistic or social

TABLE 2

Scheffe Range Tests: Vietnam, Persian Gulf, and Ideology Index Means by Academic Field (Honors and National Faculty samples combined)

	Humanities[1] ($N = 268$)	Social Science[2] ($N = 199$)	Science/Math[3] ($N = 191$)	Education ($N = 74$)	Business ($N = 98$)
VIETHAWK70	2.12	2.17	2.70	2.70	3.06
VIETHAWK90	1.93	2.01	2.45	2.60	2.79
VIETDOVE70	4.15	4.20	3.77	3.76	3.54
VIETDOVE90	4.21	4.27	3.85	3.74	3.58
VIETPROTEST	1.43	1.86	0.68	0.77	0.86
IRAQHAWK	3.05	2.92	3.51	3.58	3.85
IRAQDOVE	2.98	2.92	2.47	2.48	2.15
GULFPROTEST	2.65	2.78	1.41	1.30	1.04
IDEOFRESH	2.87	2.89	2.99	3.15	3.47
IDEOGRAD	2.44	2.32	2.93	3.03	3.34
IDEONOW	2.66	2.54	3.10	3.27	3.61

NOTE: Scheffe range test results were set at $p < 0.05$.

[1] Humanities and social science faculty did not differ significantly from each other on *any* index measures. Humanities faculty were significantly different from science/mathematics and business faculty on all HAWK, DOVE, GULFPROTEST, IDEOGRAD, and IDEONOW measures; from business faculty on VIETPROTEST and IDEOFRESH; from education faculty on all HAWK and DOVE measures, *except* IRAQDOVE, and on IDEOGRAD and IDEONOW.

[2] Social science faculty were significantly different from business faculty on *all* index measures, and from science/mathematics and education faculty on all measures *except* IDEOFRESH.

[3] Science/mathematics faculty were significantly different from business faculty on IDEONOW. Science/mathematics, education, and business faculty did not differ significantly from each other on any other survey index measures.

science training, such differences should disappear when controlling for academic discipline. That is, we should re-examine honors versus nonhonors political differences within academic fields, comparing honors directors with training in humanities to national faculty in humanities, honors directors with training in the social sciences to other faculty with social science credentials, and so on —ideally for every academic field. However, there are two reasons to simplify the proceeding analysis by bifurcating academic background into humanities/social science (HSS) disciplines as opposed to all other fields. First, HSS faculty as a whole were not significantly different in their political views and war attitudes when compared to *each other* as separate academic categories on any of our measures. At the same time, HSS professors significantly and systematically covaried in the same direction from the average political views and war attitudes expressed by faculty in all other fields. Second, the 21 percent of our honors sample whose backgrounds were distributed in fields other than HSS (that is, science/mathematics $n = 21$; education $n = 9$; business $n = 8$) does not yield a large enough number of cases per academic classification to warrant making statistical inferences unless they are grouped together in a single residual category.

Contrary to our expectations, the hypothesis that differences in honors directors' political views relative to the national faculty sample would disappear when controlling for academic discipline was only partially supported by the data summarized in Table 3. Significant political differences between honors directors and the national faculty on all survey measures did disappear when focusing exclusively on individuals who were classified together with backgrounds in science/mathemtatics, education, or business. However, when compared to their HSS counterparts in the national faculty, honors directors with HSS backgrounds continued to maintain significantly higher DOVE and PROTEST scores for both the Vietnam and Persian Gulf Wars. (Honors directors also had significantly higher IRAQHAWK scores, but they did not score significantly higher than HSS faculty in the national sample on either of the VIETHAWK indexes.) According to IDEOLOGY comparisons, honors directors with HSS backgrounds (1) showed signs of becoming slightly more leftist in their political views than HSS colleagues during graduate school (a not quite statistically significant difference at $F = 3.15$/sig. = 0.077) and (2) currently were significantly more liberal on average than other HSS faculty ($F =$ 4.50/sig. = 0.035).

Thus it appears that variation in academic background specifies, but

TABLE 3

Analysis of Variance: Vietnam, Persian Gulf, and Ideology Index Means by Type of Faculty Sample, Controlling for Academic Field

	Humanities/Social Science				All Other Fields			
	Honors ($N = 137$)	National ($N = 330$)	F	sig.	Honors ($N = 36$)	National ($N = 327$)	F	sig.
VIETHAWK70	2.05	2.19	1.41	0.235	2.80	2.78	0.01	0.915
VIETHAWK90	1.90	2.00	1.07	0.303	2.41	2.58	0.71	0.401
VIETDOVE70	4.31	4.11	5.74	0.017	3.83	3.70	0.68	0.409
VIETDOVE90	4.41	4.14	9.60	0.002	4.01	3.73	2.52	0.113
VIETPROTEST	1.91	1.48	4.02	0.046	0.71	0.74	0.01	0.917
IRAQHAWK	2.76	3.10	8.33	0.004	3.36	3.63	1.86	0.173
IRAQDOVE	3.12	2.88	4.30	0.039	2.56	2.38	0.92	0.339
GULFPROTEST	3.08	2.54	3.61	0.058	1.54	1.28	0.43	0.513
IDEOFRESH	2.99	2.84	1.52	0.218	3.05	3.15	0.29	0.592
IDEOGRAD	2.27	2.45	3.15	0.077	2.81	3.08	2.14	0.145
IDEONOW	2.45	2.66	4.50	0.035	2.99	3.29	3.04	0.082

does not fully explain, the degree of difference in war attitudes and ideology preferences when honors respondents are compared to other faculty. When controlling for academic field, we see differences in war attitudes and political orientations between honors and nonhonors respondents disappear among those who share backgrounds in science/mathematics, education, or business. But certain significant differences in political outlook do not disappear between honors and nonhonors respondents with common backgrounds in the humanities or social sciences — the very fields in which the great majority of honors directors received their academic training.

Even though age was only weakly correlated with political orientation among the national faculty in our earlier analyses, variations in age cohort distributions in academia could still help explain political differences between honors versus nonhonors faculty. According to political cohort theories, among the most important factors shaping peoples' political views are common generational experiences linked to the dominant events and problems of particular historical periods in which individuals come to maturity. The political consciousness of a particular age cohort may be galvanized by massive exposure to and participation in a series of watershed events that separate the forming experience of one generation from another [7, 8, 11, 17, 22, 23, 29]. Other studies have demonstrated the extent to which the Vietnam War became a political turning point for both elites and masses in the United States, fracturing public opinion on the goals and means of U.S. foreign policy ever since [16, 35]. Thus, in considering the demographic characteristics of honors directors as a segment of the American professoriate, we asked the following questions: To what extent are honors programs currently directed by faculty who, as students themselves, were predominantly part of the Vietnam generation in recent American history? To what extent are honors directors' political orientations and war attitudes linked with generational exposure to and involvement in massive campus protests during the 1960s against the Vietnam War?

To address these questions we attempted to divide our faculty comparison groups into three cohort categories: Pre-Vietnam, Vietnam, and Post-Vietnam. Any specification of political age cohorts inevitably requires some arbitrary judgments. As upper and lower age limits for defining a Vietnam cohort we designated respondents between the ages of 50 years and 38 years at the time of our survey. We divided the remainder of the faculty between those who were older than 50 years of age (the pre-Vietnam cohort) and those who were younger than 38 when the survey was taken (the post-Vietnam cohort). [The rationale for these particular cohort classifications is elaborated in 30, 31].

Our findings demonstrated that a Vietnam cohort of faculty did statistically dominate in academia at the time of our survey, but especially in honors colleges or programs, where a majority of three-fifths (57 percent) of the directors were between the ages of 38 and 50. While a substantial proportion (40 percent) of honors directors were classified as belonging to a pre-Vietnam cohort, only a tiny fraction (4 percent) were young enough to be considered as part of the post-Vietnam generation in current academia. In comparison, a 44 percent plurality of the general faculty sample was classified as belonging to the Vietnam cohort, with 36 percent distributed in the pre-Vietnam cohort and 20 percent in the post-Vietnam cohort, respectively. (Overall differences in the distribution of age cohorts among honors programs and the national professoriate as a whole were statistically significant, with chi-square at 26.4/sig. = 0.000.) In addition to the disproportionate number of Vietnam era faculty involved in directing honors programs, it should also be noted that honors directors were much more likely to be tenured (81 vs. 59 percent) and full professors (57 vs. 33 percent) in comparison to their national faculty counterparts as a whole (chi-square = 30.2/sig. = 0.000, and 65.8/sig. = 0.000, respectively). Because professorial status and tenure protect academic freedom and contribute greatly to job security, it could be argued that these are supplementary factors which, in conjunction with a Vietnam cohort majority, could help explain the greater degree of political dissent expressed by honors directors in our survey.

If the current existence of a disproportionate Vietnam cohort among honors directors helps explain their stronger antimilitarism, liberalism, and dissent tendencies compared to other faculty, then we should expect these differences to disappear when controlling for cohort categories in academia. Unfortunately, because there was such a small number of honors directors ($n = 7$) under the age of 38 who could be classified as belonging to the post-Vietnam cohort, we could only draw meaningful inferences by making Vietnam and pre-Vietnam cohort comparisons, as shown in Table 4.

Our findings failed to support the political cohort hypothesis. Most honors versus nonhonors political differences did not disappear when controlling for age cohorts. Thus, honors directors classified by age as belonging to a pre-Vietnam cohort remained significantly different in their political attitudes in comparison to other pre-Vietnam faculty as measured by every Vietnam and Persian Gulf War indicator developed

TABLE 4

Analysis of Variance: Vietnam, Persian Gulf, and Ideology Index Means by Type of Faculty Sample, Controlling for Age Cohort

	PRE-VIETNAM COHORT				VIETNAM COHORT			
	Honors (*N* = 68)	National (*N* = 237)	*F*	sig.	Honors (*N* = 98)	National (*N* = 289)	*F*	sig.
VIETHAWK70	2.49	2.82	4.2	0.040	2.01	2.23	2.7	0.102
VIETHAWK90	2.12	2.57	8.6	0.004	1.93	2.11	1.8	0.178
VIETDOVE70	4.03	3.70	7.0	0.009	4.36	4.06	9.0	0.003
VIETDOVE90	4.24	3.74	13.8	0.000	4.42	4.11	8.9	0.013
VIETPROTEST	1.32	0.72	8.2	0.005	2.00	1.59	2.6	0.111
IRAQHAWK	2.90	3.47	11.8	0.001	2.88	3.26	7.8	0.005
IRAQDOVE	2.93	2.44	10.3	0.002	3.04	2.72	5.4	0.021
GULFPROTEST	2.49	1.60	7.2	0.008	2.96	2.14	6.4	0.012
IDEOFRESH	3.21	3.10	0.5	0.492	2.89	3.01	0.8	0.388
IDEOGRAD	2.44	2.90	11.3	0.001	2.35	2.61	4.3	0.039
IDEONOW	2.49	3.12	23.0	0.000	2.61	2.86	4.3	0.038

for this study. Similarly, current honors directors of the Vietnam generation retained their political differences in comparison to other faculty of their generation on the majority of (5 out of 8) Vietnam and Gulf War indicators. In almost every comparison, regardless of cohort affiliation, honors directors continued to maintain statistically significant higher DOVE and PROTEST scores than did corresponding representatives of the national faculty. Finally, the original pattern of ideological divergence by honors directors from the national sample in graduate school, continuing to the present, persisted within cohort control categories: honors directors from both pre-Vietnam and Vietnam cohorts were significantly more left-leaning in their social and economic views in their current academic positions, as well as in graduate school, than were their generational counterparts in the national professoriate. Furthermore, while current honors directors of the Vietnam generation systematically scored highest on all HAWK, DOVE, and war PROTEST measures, according to our IDEOGRAD and IDEONOW indexes, the particular faculty cohort whose overall ideological orientations had changed the least since graduate school and who currently appeared most liberal in their views, was the *pre-Vietnam* cohort of honors directors. This result contrasts with our findings in previous studies of the national professoriate, which showed that pre-Vietnam faculty as a whole were the least liberal age cohort in contemporary academia [30, 31].

One important additional consideration is the extent to which political attitudes are shared by faculty employed at campuses which, in fact, sponsor honors programs. Conceivably, colleges and universities that sponsor honors programs may already have other institutional characteristics that are more conducive to political liberalism in general than schools that do not have honors programs. If this is the case, the political differences between honors directors and other faculty indicated in our survey could simply be an artifact of a more liberal institutional environment in which honors programs are, coincidentally, most likely to be supported. To test for this possibility we identified a subset ($n = 131$) of our national faculty sample who were employed at institutions that did have honors programs and then compared their political responses to those of honors directors ($n = 94$) at these same institutions, as shown in Table 5.

The results presented in Table 5 give credence to the proposition that institutions that house honors programs are also more likely to employ faculty whose general political orientations are similar to those of honors directors. Statistically significant differences between honors directors and their institutional colleagues were not maintained on our VIETHAWK, IRAQDOVE, and PROTEST measures. At the same time, however, honors directors at these institutions continued to have significantly higher mean VIETDOVE scores and lower IRAQHAWK scores, and, according to IDEOGRAD and IDEONOW measures, they were significantly more left-liberal than their faculty colleagues,

TABLE 5

Analysis of Variance: Vietnam, Persian Gulf, and Ideology Means for Honors Directors and Faculty Employed at the Same Institutions

	Honors Directors ($N = 94$)	National Faculty Sample ($N = 131$)	F	sig.
VIETHAWK70	2.17	2.33	1.09	0.2971
VIETHAWK90	1.93	2.05	0.73	0.3947
VIETDOVE70	4.27	3.98	6.42	0.0120
VIETDOVE90	4.42	4.09	9.09	0.0029
VIETPROTEST	1.68	1.46	0.59	0.4431
IRAQHAWK	2.89	3.18	3.58	0.0599
IRAQDOVE	2.99	2.78	2.02	0.1565
GULFPROTEST	2.65	2.29	1.05	0.3066
IDEOFRESH	3.02	2.95	0.22	0.6393
IDEOGRAD	2.38	2.77	9.23	0.0027
IDEONOW	2.55	2.91	8.23	0.0045

both as graduate students and at the present time. Thus, as occurred previously when controlling for academic discipline and age cohorts, certain residual political differences still remained (even with smaller samples) when we compared honors directors and their faculty colleagues who were employed at the same institutions. This was particularly true with regard to their mean IDEOGRAD and IDEONOW positions.

To summarize the principal conclusions of our data analysis: (1) Both academic training in HSS disciplines and opposition to the Vietnam War were linked statistically to political leftism, antimilitarism, and willingness to consider active protest as a course of personal political action. (2) Honors directors' academic credentials were predominantly in HSS fields, and a disproportionate number of current directors were part of the Vietnam cohort of college students in contemporary American history. (3) Honors directors' HSS backgrounds and history of opposition to the Vietnam War help explain many of their current political attitudes, but our survey did not explain satisfactorily why honors directors' responses were consistently more pronounced on several political measures when compared to those of other faculty who also had credentials in HSS disciplines and/or were part of the Vietnam cohort in American higher education. (4) It may be inferred from our data that honors programs typically are situated at relatively liberal institutions, which partially accounts for the greater liberalism of honors directors nationally, but honors directors at these institutions also continued to maintain more left-liberal views on several key measures compared to their faculty colleagues.

Discussion

In the following discussion we will speculate about some additional factors not considered or measured in our original survey that might contribute to a better understanding of the political orientations of honors directors in American higher education and suggest some orienting hypotheses for future research on the topic of political socialization in honors programs.

We propose that in order to explain more fully why certain political orientations of faculty involved in directing honors programs tend to vary from those of other faculty groups, a social process approach be considered that not only focuses on the characteristics of faculty who are drawn to honors programs (including their intellectual backgrounds and generational perspectives), but conjointly considers the types of students recruited into honors programs and the normative expectations of the honors program itself. Within these parameters we hypothesize that it is the interaction between certain types of faculty and students whose relationship is structured by a particular type of academic program that helps to explain the greater persistence of left-leaning political views and disposition for dissent among current honors directors.

The Process of Accentuation

In their earlier review of the literature on college impacts (more recently updated and expanded by Pascarella and Terenzini), Feldman and Newcomb concluded that "no single principle has emerged in so many different guises as that of accentuation" to explain both the persistence and change of individuals' initial, precollege dispositions [10, p. 333]. Whatever the characteristics of individual students are that selectively propel them toward a particular academic setting or major, those same characteristics are apt to be reinforced and extended by experiences incurred in those selected settings. "First, the prominence of initial characteristics — say religious attitude in a sectarian college or vocational aspirations in a technical college — indicates a readiness on the part of a considerable number of individuals to move in directions compatible with those characteristics. This readiness is then reinforced by their discovery that many others share the same interests, which are thus socially reinforced" [10, p. 328]. In short, initial intellectual and attitudinal differences among students are typically accentuated by their college experience as they pursue different educational career paths. At the same time, the more incongruent students' initial dispositions are relative to the intellectual orientation of the educational setting in which they find themselves, the more likely they are to change majors, withdraw from school, or switch their enrollment to a different institution.

The principle of accentuation in formal education may be stated conditionally as follows: "If students initially having certain characteristics choose a certain setting (a college, a major, a peer group) in which those characteristics are prized and nurtured, accentuation of such characteristics is likely to occur" [10, p. 335]. Stated as a general proposition, Feldman and Newcomb conclude that "processes of attracting and selecting students are interdependent with processes of impact" [10, p. 334]. After twenty years of additional research, Pascarella and Terenzini report that, "consistent with Feldman and Newcomb's conclusion, we found many within-college effects to be essentially the accentuation of initial student characteristics" [28, p. 610].

We propose that the principle of accentuation not only applies to students attracted to honors programs, but may also be applied to faculty who are drawn into involvement as honors directors.

Characteristics of Honors Faculty

Perhaps the most obvious characteristic shared by a large majority of honors directors is their own student backgrounds in HSS disciplines. This fact was demonstrated by our survey results in which four-fifths of the honors respondents reported advanced degrees in HSS fields of study. Given that training in HSS disciplines helps to explain a greater propensity for social criticism and dissent, we nonetheless must explain why honors directors with HSS backgrounds were often *more* critical of U.S. war policies when compared to other HSS faculty in our survey. This question leads us to offer the following theoretical speculations in which we characterize career paths toward involvement in honors programs as a series of initial attractions and subsequent accentuations.

We hypothesize that, as HSS students (especially by the time they were in graduate school), current honors directors were among those in their academic cohorts who were most predisposed to what Richard Flacks [12] has defined as the "tradition of the left." Flacks argues that the modern tradition of the left originated in the nineteenth century among groupings of intellectuals who, inspired by the American and French revolutions but cut off from avenues of political power by traditional elites, searched for ways to implement fully in history their radical democratic ideals and the humanistic values of the Enlightenment. Flacks concludes that a certain class of intellectuals — those writers, artists, clergy, and academics who are motivated by their desire to become historical actors, who want to shape social development, who most importantly are committed ideologically to an "ethic of collective responsibility" and social welfare rather than individualism and the pursuit of self-interest — have been the primary carriers of the tradition of the left in both Europe and the United States. Over time, many universities in both Europe and the United States have become important centers of intellectual leftism, particularly those that sponsor major HSS programs [11].

In their student days we surmise that current honors directors were typically idealistic, morally challenged by apparent discrepancies between democratic values and social inequities in the United States, and particularly attracted to a conception of themselves as intellectuals "vocationally involved with the critical reconstruction of social meaning" [12, p. 119]. Such dispositions likely were accentuated by graduate training in HSS disciplines, where, as previously indicated, students are socialized in a tradition of intellectual discourse in which the cultural products and social practices of their society are critically examined. In addition, many current honors directors no doubt *were* politicized by their opposition to the Vietnam War, further accentuating their attraction to leftist cultural critiques and political perspectives.

We hypothesize that, once acquired and accentuated, these sorts of critical values and intellectual self-conceptions predispose certain faculty to be attracted to honors programs, should opportunities for their involvement arise. We presume that active involvement in honors is attractive to such individuals precisely because the programmatic cultivation of critical thought in undergraduate education tends to be taken most seriously in honors programs. We hypothesize that most faculty attracted to honors (in contrast to many other faculty who become preoccupied with their own narrow research interests and perceive undergraduate teaching as a burden) welcome the opportunity to work closely with bright undergraduate students in a mentorship capacity that allows them to have meaningful influence in shaping their students' intellectual development. Through cultivation of their students, educators who conceive of themselves as intellectuals equipped to respond critically to the conditions of their society can mitigate apprehension that their specialized academic work might be largely irrelevant to the dynamics of social change and cultural development. It is through their influence on students that many critical educators can hope, over the long run, to realize some shaping impact on the character of their society.

Characteristics of Honors Students

Honors colleges tend to recruit and select students who, we hypothesize, are not only academically qualified, but also are predisposed to the critical, liberal arts curriculum emphasized in honors. This generalization follows from research done on conventional student selection of schools and majors cited by Feldman and Newcomb and Pascarella and Terenzini. As with any student subpopulation, there is bound to be a range of aptitudes, values, varying individual interests and character traits among honors students. But we also hypothesize that intellectual differences among honors students are significantly less great than corresponding differences between honors students as a group and other student subpopulations. Like their faculty mentors before them, we hypothesize that a majority of students attracted to honors programs are characteristically idealistic, responsive to humanistic values, and relatively open to modes of critical questioning, in which sympathy for minority struggles rather than elite privileges tends to be emphasized.

Those students recruited to honors programs who are least open to these emphases are the ones, we would hypothesize, who are most likely to drop out of the program.

We also surmise that for many honors students, matriculation into honors programs puts them into close association for the first time with a concentration of peers who share their intellectualism and moralistic values. Those students initially attracted to honors programs by the affinity between their own value dispositions and the humanistic promise of the curriculum are likely to be motivated by both honors faculty and their peers to further strengthen a commitment to critical thinking and liberal value orientations in the process of educational accentuation.

Characteristics of the Honors College Environment

We hypothesize that an important consequence for honors directors in the process of recruiting, selecting, and mentoring students is reinforcement of their own value commitments. In the role of advocate of the honors college curriculum, directors not only celebrate and teach the humanistic tradition of critical discourse in human history, they in turn are likely to be pushed by the youthful idealism of inquisitive students to demonstrate their own attachments to humanistic values in the debate over contemporary issues of inequity, injustice, and oppression in a professedly egalitarian society. Thus we would argue that the principle of accentuation tends to work simultaneously for both faculty and students in interaction with one another.

In their earlier review of the research literature on the effects of college, Feldman and Newcomb concluded that, with individual exceptions, college faculties did not appear to be responsible for having much campuswide impact on students' values *except* in settings where the influence of student peers and faculty complemented and reinforced one another [10, p. 330]. The conditions for campuswide impact on the intellectual orientations of students were most likely to be found in small, residential colleges, which featured the relative homogeneity of both faculty and student interests, coupled with the opportunity for regular, informal interaction. Feldman and Newcomb went on to acknowledge the possibility that these conditions for maximizing institutional impact on selected students could also be maintained by certain *subunits* of large, impersonal universities. Subsequently, in an article aimed at clarifying the conceptual and operational meanings of accentuation, Feldman and Weiler conjectured that accentuation of group differences was more likely to occur in subsettings of large universities where students were given a greater degree of choice and where the subsettings themselves were highly selective in admitting applicants [9,

p. 405]. Extending these observations, Pascarella and Terenzini more recently concluded that "the impact of student-faculty informal contact is determined by its content as well as by its frequency. The most influential interactions appear to be those that focus on ideas or intellectual matters, thereby extending and reinforcing the intellectual goals of the academic program" [28, p. 620].

We would argue that, in principle, selective admissions and the relative homogeneity of intellectual concerns and patterns of faculty-student interaction in honors college programs resemble some of the distinctive characteristics of the small college environments (or informal subunit environments) identified by Feldman and Newcomb, Feldman and Weiler, and Pascarella and Terenzini. We hypothesize that honors programs simultaneously tend to attract and select certain kinds of faculty and students who share humanistic orientations and a moral attraction to the tradition of the left. For both faculty and students the normative expectations of the honors program in favor of social criticism provide an intellectual environment in which their ideological orientations are mutually accentuated. It is this ongoing process of value accentuation which we suggest helps to explain why the political responses of honors directors to socioeconomic issues, U.S. military intervention in Third World countries, and willingness to engage in public dissent often varied to a significant degree from those of other academics sampled in our survey, including HSS faculty situated in conventional academic departments. Had we conducted a parallel survey of student attitudes, comparing honors students' war reactions and ideological orientations to those of other college students, we anticipate that we would have obtained precisely the same pattern of results that emerged in our study of faculty comparisons.

Thus, as orienting hypotheses for additional research on political socialization in academia, we would predict that honors students' political orientations are (a) more liberal and less variable than those of nonhonors students, and (b) more strongly correlated with the political views of their honors professors than they are with the political views of other students. These student patterns should be evident both at Time 1, when honors students begin their college careers, and become even more pronounced at Time 2, when they graduate. Similarly, we would predict that (c) faculty who become honors directors at Time 1, when they first assume their positions, are more left-liberal on average than their disciplinary colleagues, and that (d) at a subsequently designated Time 2, honors directors political views will be even more left-liberal compared to disciplinary colleagues than they were at Time 1.

Given the paucity of published research on honors programs in the

United States, we must regard our study of the war attitudes and political orientations of honors directors to be a preliminary effort. There are a number of research avenues that could and should be pursued, including more systematic study of the predispositions and social characteristics of both instructional staff and honors students; variations in the substantive content of honors curricula and teaching formats (not considered at all in our study); regional and institutional variations in honors programs (such as size and academic standing of the host college or university, urban versus small town locales, private versus public institutions, and so on); the post academic careers and values of honors graduates; and further political comparisons of honors faculty on a variety of different issues relative to other faculty comparison groups, such as directors of minority or ethnic studies programs, and gender studies programs. Like honors, these latter kinds of programs should provide especially good settings for assessing patterns of academic selection and value accentuation in higher education.

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Stephen Bell

University-Industry Interaction in the Ontario Centres of Excellence

Introduction

The issue of corporate-university linkages and university research has been at the forefront in Canadian higher education since the late 1980s, when a consensus emerged among government, industry, and universities that knowledge and highly qualified people are two main components in achieving economic growth. According to this consensus, universities through their role as creators and disseminators of new knowledge as well as through the provision of highly qualified people have a pivotal role to play in the economic development process.

There are a multitude of reasons for sharply focused attention on corporate-university linkages in Canada, the United States, and Europe. Primary among them is the changing nature of the economy (industrial to information), shifts in the nature and rate of technological change, the emergence of competitive global markets, and increased competitiveness. The development, or enhancement, of alliances among universities, industry, and government is widely seen as the prescription for the malaise.

There exist many different institutional forms of corporate-university linkages [17, pp. 25–40]. The resurgence of interest in corporate-university linkages and university research, however, has led to the proliferation of one form of linkage — university-based or university-connected research centres [19, pp. 278–279; 38, p. 5]. In Canada, this resurgence has manifested itself in an alliance between university, in-

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dustry, and government in the creation and funding of Centres of Excellence [39, p. 28].

The term "Centre of Excellence," however, is neither new nor unique. It has been used to describe government programs to promote the development of advanced technology in the states of Massachusetts [28] and Utah [44] as well as to describe a number of academic and research programs at various Canadian universities [22, p. 35]. Centres of Excellence may also be known as University-Industry Research Centres (UIRC), Science and Technology Centres (STC), or Organized Research Units (ORU). The "centre" in centre of excellence refers to a model for conducting research that has a long history in universities. Internal university research centres facilitate networking between groups of scholars in one or more departments and/or universities who are teaching or researching in similar areas [13, pp. 80-83; 20, pp. 49-50; 23, pp. 1-28]. However, as applied to the fostering and enhancement of corporate-university research linkages, the centre model was first used in the early 1970s, when the National Science Foundation (NSF) funded various program models to promote collaborative industry-university research [21, 33].

In 1987 the Government of Ontario embarked on an ambitious five-year, $204 million program, creating seven Centres of Excellence.[1] After a successful review, the program was extended for a further five years and allocated an additional $200 million in funding [31]. In 1989 the Government of Canada followed suit and launched a five-year, $240 million program, creating fifteen Networks of Centres of Excellence [24]. This program was extended for a further five years and allocated an additional sum of $197 million, although only ten of the fourteen Centres were re-funded.

The underlying assumption in the creation and financing of the Ontario Centres and other UIRCs is that industry and university scientists *will interact,* that technology transfer will take place, and that as a result industry will become more competitive.

Evidence regarding the effectiveness of university-industry research relationships, and in particular UIRCs and the Ontario Centres, in terms of technology transfer to industry is mixed [17, p. 13; 43, pp. 53-70]. The data that refute the claims raise questions with respect to the cost effectiveness of universities and the ability of universities to enhance the competitiveness of industry [5, 41, 42, pp. 5-24]. The data to substantiate the effectiveness of UIRCs is contradictory. While UIRCs are seen as functioning as effective technology transfer agents to industry, the evidence suggests a low level of industrial involvement in the initiation and operation of UIRCs and a low level of satisfaction by university faculty with the level of communication with industrial members [34, pp. 67–70]. The evaluation of the early U.S. National Science Foundation UIRCs[2] found that university-industry interaction overwhelmingly took place at formal Center meetings [34, pp. viii]. In addition, there is a fear that UIRCs take funds away from individual investigators [14, pp. 44–48].

According to Fairweather, few evaluations of university-industry research relationships exist. "Since 1982, NSF and other national associations increasingly have become advocates, arguing for increased links between business and higher education rather than evaluation of existing relationships. For industry-university research relationships, assessment remains the missing ingredient" [17, p. 77].

This article attempts to fill some of the "evaluation void" and reports on the results of a "network analysis"[3] of communication patterns between university scientists and industrial scientists in four of the Ontario Centres and compares the results to an analogous university-industry scientific network (control group) that did not receive targeted government funding. The main question that the article seeks to answer is, given the different research orientation of industry and university scientists, do university scientists who are members of and funded by the Ontario Centres include industrial scientists in their scientific communication networks? The secondary question that the article seeks to answer is, do the Ontario Centres, which are formally and deliberately established scientific structures, engender communication behaviour and technology transfer results that are vastly different from traditional university-industry scientific structures? In other words, would the communication patterns and technology transfer results of academic and industrial scientists in the Ontario Centres be markedly different from the communication patterns and technology transfer results of academic and industrial scientists in an analogous non-government-funded scientific communication network? Would there be, and/or should there be, more university-industry communication in the Ontario Centres compared to an analogous university-industry group given the *targeted* government money? What is important for this article is to discuss the relationships, if any, between the level of communication between university and industry and the implications for technology transfer. Eveland noted that "evidence from the communications literature indicates that the structure and procedures characteristic of communication among scientists and engineers affect the nature of the science practiced and the effectiveness with which that science makes its way into applications" [16, p. 5].

Background

In the mid-1980s, the Science Council of Canada funded a series of background studies, discussion papers, and conferences on various aspects of corporate-university linkages in Canada. This material was compiled into a major report published in 1988 [39], which was the first comprehensive attempt to study the issue of corporate-university linkages in Canada. Three broad issues were examined: services to support corporate-university linkages, research and development linkages, and educational linkages. One of the background studies [12] showed that in the 1980s Canadian universities made significant changes in the planning, organization, and management of their research enterprise, including the establishment of an administrative unit responsible for technology transfer. The extent and mandate of technology transfer units vary from university to university and range from increasing faculty awareness of possible interactions with the corporate sector, to identifying commercially significant research, screening inventions, and developing spin-off companies [12, pp. 9-21]. The conclusions contained in the Science Council's final report [39, pp. ix-x] were similar to many reports that had previously emanated from the United States [2, 9], which emphasized the necessity of linkages between knowledge creators (universities) and knowledge users (industry).

The government/university/industry consensus that corporate-university research linkages are the prescription for our economic afflictions is not universal. According to Geiger, "On campus the consensus was not shared by the majority of faculty and students, who were uninvolved with and antipathetic toward industry" [20, p. 305]. A small but vocal segment of the literature on corporate-university research linkages has consistently raised questions about the legitimacy of the consensus. For example, Bok argues that

> university research and its linkages to industry are not decisive factors in the competitive problems of the United States. I fear that if we continue to try to justify our research (university) in those terms, to try to exploit competitiveness as a reason for building science and links with industry, we are likely to end by disappointing our constituents to our ultimate disadvantage [6, p. 15].

Many academics see the intensification of corporate-university linkages as a threat to academic freedom [7, pp. 51-55]. The intensification also brings to the foreground far greater potential for conflict of interest issues [7, pp. 67-76]. Conflict of interest relates to individuals and institutions and has implications for finances and commitment, for example, where a person's obligations to a university-industry partnership interfere with their teaching and broader university service obligations.

There is also an impression that involvement with industry may corrupt university-based research and significantly erode or eliminate communication between scientists, and there is some evidence to support this argument. Kenney in documenting the origins of start-up companies in the biotechnology industry — companies whose initial development was entirely dependent on university scientists and university research, found that "the creation of new social relationships to accommodate biotechnology has been rapid" [25, p. 4]. The new social arrangements, however, include constraints on the

> type, amount, and destination of information disseminated. Information flow has not been halted; rather the flow has been redirected. . . . Professors who are corporate equity owners naturally direct the products of their research toward their companies. . . . The redirection of information flows with the objective of securing profit is having the effect of increasing secrecy on campus [25, p. 122].

According to Buchbinder and Newson, the existence of new social relationships between universities and corporations has encouraged the "development of new structures and decision-making procedures at many universities . . . that are not subject to the policies or decision-making procedures of normal collegial bodies" [8, p. 14].

The biotechnology revolution initiated new forms of university-industry interaction, "the most striking of which is the multimillion-dollar, multiyear contract between a single university and a single company" [25, p. 5]. Biotechnology then "became the principal focus for an opposing current of opinion concerned with the alleged dangers of university collaboration with industry" [20, p. 305]. Questions about the influence of industry on biological research in universities are applicable to other areas of university-industry research interaction.

> Did the influence of industry steer biological research from pure to applied topics? Was the free flow of information impeded? Were academic norms violated through conflicts of interest? Could faculty commit themselves to their companies while also being good citizens to their departments and universities, good colleagues to their fellow faculty, and mentors to their students? [20, pp. 306.].

The resurgence of interest in corporate-university research linkages and the proliferation of centres of excellence or university-industry research centres has occurred while university and industry are still struggling to come to terms with each other. From the scientist's perspective, the struggle is in balancing the appropriate amount of pure and applied research, maintaining the free flow of information, and coping with the demands of senior university administrators to commercialize.

Ontario Centres of Excellence

In Canada, until the mid-to late 1980s, there had not been the desire by federal or provincial governments and/or government agencies that fund science and technology initiatives to experiment with various forms of industry-university interaction. Thus it was with a great deal of fanfare that the Premier's Council on Technology was established by the Government of Ontario in July of 1986 with C$1 Billion in funding (over ten years) to help steer Ontario into the forefront of economic leadership and technological innovation. The Premier's Council consisted of representatives from large corporations, small businesses, universities, and large labour unions. It also included Cabinet-level representation of four ministers who met to attempt to forge a consensus on directions and priorities for Ontario.[4]

The creation of the Ontario Centres was the first major initiative of the Premier's Council and was a result of over a year's consultation with Ontario's universities and business leaders. A Call for Proposals was issued in January 1987 by the Ontario Ministry of Industry, Trade, and Technology (MITT) that set out the criteria against which submissions from universities and industry would be judged. All proposals would be expected to demonstrate the quality of their researchers and of the proposed fundamental research; the economic relevance of their research; evidence of university-industry linkages; the potential economic benefits for Ontario and potential to develop a lead position in Canada and internationally; how the centre would maximize existing university and industry strengths; how the centre would include small, high-technology firms; and the extent of participation of graduate students in industry related research and spin-offs [1, pp. 11-12]. The criteria for the centres did not exclude proposals from outside the basic and applied sciences provided they could demonstrate economic relevance.

Twenty-eight proposals were submitted to the Premier's Council, representing 29 universities, colleges, and hospitals; 160 corporations; 6 industry associations; 3 government departments; 544 principal investigators, of whom 467 were from universities, colleges, and hospitals and 77 were from industry [1, p. 26]. The extensive response to the Call for Proposals is significant in that it showed the widespread interest that the program had created in the Ontario university and industrial communities.

After an extensive external review process, seven centres were chosen to receive Ontario government funding. They are: (1) Ontario Laser and Lightwave Research Centre (OLLC); (2) Institute for Space and Terrestrial Science (ISTS); (3) Manufacturing Research Corporation of Ontario (MRCO); (4) Waterloo Centre for Groundwater Research (WCGR); (5) Information Technology Research Centre (ITRC); (6) Ontario Centre for Materials Research (OCMR); (7) Telecommunications Research Institute of Ontario (TRIO). As is evident, none of the centres chosen were from outside the basic and applied sciences. Eight universities shared in the distribution of C$204 Million over five years (1987-1992), and a very positive external review process allowed the Ontario Centres to be renewed for a further five years (1992-1997), but the overall program budget was reduced to C$186 million [31, p. 2].

The objectives of the Ontario Centres are to stimulate advanced scientific research, to train and develop world class researchers, and to encourage the transfer and diffusion of technology to industry [30, p. 8]. The Ontario Centres share many of the characteristics of university-industry research centers developed in the United States by state governments as well as by the National Science Foundation, with a number of important modifications and elaborations. Like most UIRCs, the Ontario Centres are university-based interdisciplinary research centres. However, in an important departure from most UIRCs, the Ontario Centres (5 out of 7) are also *multi-university* and focused on *fundamental* as opposed to *applied* research. The different foci reflect a specific policy choice of the Government of Ontario, which, like all other governments, is determined to enhance the competitiveness of provincially based industry via targeted investments in scientific areas in which its universities operate at "the leading edge." Industry plays a vital role in the management and operation of each centre. Although it does not fund the research program, industry has a direct say in the allocation of research monies and priorities. The rationale is that the codetermination of the research agenda by industry in conjunction with the emphasis on fundamental as opposed to applied research will provide industry with precompetitive research results, which companies can use to shape and focus their internal research and development agenda and technology development.[5]

Each of the Ontario Centres is an autonomous legal entity (nonprofit corporation) that has a contract with MITT and with each university from which the principle researchers are drawn. Because the universities involved in the Ontario Centres are funded via a research *contract* instead of a research *grant,* the first five-year contract provided for overhead costs to be charged at the rate of 65 percent of direct salaries and benefits;[6] the second five-year contract provided for overhead to be charged at the rate of 50 percent of direct salaries and benefits [31, p. 6]. The research contract is extensive (35 pages in addition to schedules) containing detailed reporting and accountability requirements and periodic review mechanisms. For example, the contract has attached schedules for Guidelines to the Business Plan, the Actual Business Plan, Communications Plan, Evaluation Panel Assessment, Management Organizational and Procedures, Current Industry Participation, Principal Investigators, Base Data and Performance Measures, a Pro-Forma request for funds form, Annual Industry-Centre Integration Report, and an Annual Research Programme Report.

Each of the Ontario Centres has a common organizational structure consisting of a board of directors, which includes both industry and university representatives, a program committee to determine the priorities of the research program, and an external scientific program review committee to review the research program to ensure that scientific quality is maintained. The overall research program in each centre is organized around "research thrusts," or "research areas." A typical centre has approximately five research thrusts.

National Science Foundation Centers

The first NSF program model was the University-Industry Cooperative Research Centers (UICRC) program, initiated in 1973 with pilot centers at Massachusetts Institute of Technology, North Carolina State University, and MITRE Corporation. These experimental centers provided data from which to launch a permanent UICRC program in 1978.

Each UICRC supports and coordinates a program of interrelated research projects involving university faculty, staff, and graduate students from one or more academic departments. The research focus of these centers is mostly on applied research, although a broad mixture of various types of research does occur. The funding of a center by NSF is intended to create a permanent organization for ongoing collaboration between university scientists and a consortium of industrial companies. The NSF provides a one-year planning grant and a five-year operational grant, which declines gradually over the five-year period. From the outset, industry funding is provided by a consortium of firms who pay an annual membership fee and are expected to fund the centers at a rate three times that of the NSF rate. At the end of the five-year operational period, each center must be financially dependent on industry for the continuation of its activities. Since 1977 the NSF has funded 26 UICRCs [21].

Building on the positive experience generated with UICRCs, between 1985-87, the NSF sponsored 14 Engineering Research Centers (ERC), which were awarded on a competitive basis. The purpose of the ERCs was to strengthen research in engineering in order to improve American competitiveness. The basis for funding ERCs is basically the same as that for funding the UICRCs.

The most recent evolution in the NSF center model for university-industry collaboration is the development of Science and Technology Centres (STCs). The STCs are markedly different from UICRCs and ERCs. The STCs are interdisciplinary, university based centers, concentrating on *fundamental* research as opposed to *applied* research. Whereas the research agenda of UICRCs is mostly applied and co-funded by industry, the research agenda of the STCs is primarily fundamental, with core funding provided by NSF. The principal rationale for the STCs is to ensure continued U.S. preeminence in science and an adequate base of trained scientists. The primary goal is to exploit opportunities in science and technology where the complexity of the research problems requires the advantage of long-term resource commitments, scale, duration, and/or equipment and facilities that can only be provided by a university-based research center [32].

After an extensive merit review of 323 proposals, the NSF funded twelve STCs in 1989 with an annual cost of $24 million. Continuation of funding past the first year was dependent on available funds and on satisfactory progress by each center. Erich Bloch, then director of the NSF stated:

> The Science and Technology Centers are unique because they link university researchers, in many cases from geographically separate academic institutions, with other researchers in industry and national labs, in long-term basic research projects. One very important benefit we hope to see from this is a much shorter time span between actual discovery and utilization. The fast transfer of knowledge is critical to our nation's ability to compete in the world market [35, p. 2].

Technology Transfer

The term "technology transfer" has a multitude of definitions that vary depending on the context in which it is used. For example, Feller states:

> Technology transfer has had and continues to have several different meanings, including improved research utilization, spin-off functions from other

> R&D activities, and technical assistance; . . . technology transfer has meant the movement of a particular technique, a specific "hardware" from an original user to a different set of users [18, pp. 6–7].

The *hardware* definition of technology transfer suggests a linear process in which government or universities initiate and transfer "technology" to various clients — industry, other government and non-governmental agencies, and the public. This model is known as the "centre-periphery" model of technology transfer and has been challenged as being vastly oversimplified, because the process of technology transfer is not necessarily unidirectional.

The conceptual framework of technology transfer has broadened considerably in recent years, and technology transfer frameworks associated with corporate-university research linkages have been formulated by Baldwin and Green [4], Larsen and Wigand [26], and Matkin [29]. Baldwin and Green define technology transfer as "the movement of ideas and innovations from university laboratories and research centres to industry and on to the marketplace" [4, p. 5]. This definition is similar to the one formulated by Larsen and Wigand, who define technology transfer "as the process through which the results from basic and applied research are communicated to potential users" [26, p. 587]. Finally, Matkin defines technology transfer as

> the transfer of the results of basic and applied research to the design, development, production, and commercialisation of new or improved products, services or processes. That which is transferred often is not really technology but rather a particular kind of knowledge that is a precursor to technology. The transfer is from the originator to the developer of that knowledge [29, p. 5].

These definitions of technology transfer are free of the shortcomings that are inherent in the definition of technology transfer as a unidirectional process, but they may also be so general that they can be of limited use for specific science and technology policy needs.

The multitude of divergent definitions of technology transfer leads to functional and organizational forms of technology transfer. These forms will to some extent reflect a particular definition of technology transfer. If one agrees with Feller [18] that "the transfer of knowledge occurs at whatever stage of the process of technological innovation that universities and firms happen to be forming alliances" [18, p. 7], then *functional forms of technology transfer,* such as the exchange of research data, joint published articles, patent and licensing arrangements, cooperative research projects, and personnel transfers, and *organizational technology transfer mechanisms,* such as meetings, seminars, conferences, participation on advisory boards and councils, can by themselves, or combined, be deemed applicable. Thus, the range of definitions of technology transfer is all encompassing, from the unidirectional "hardware" definition to a much broader definition that puts greater emphasis on technology transfer as a *process*, of which knowledge transfer is a necessary precursor, as opposed to *technology transfer as a commodity*. This article adopts the above broad conceptual framework that refers to *technology transfer as a process*, and it is this framework that will be utilized when analyzing the technology transfer activities of the Ontario Centres. The analysis of the communication patterns between industry and university personnel in the Ontario Centres is therefore essential in helping to determine the extent to which technology transfer as a process takes place.

Conceptual Framework

Sociologists of science have shown that the literature of science consists of tightly knit clusters that represent research areas and can also be described as "social circles." Crane describes a social circle as follows:

> A social circle is characterized by the presence of direct and indirect ties among many but not necessarily all of its members. The extent to which members of an area are linked to one another can be measured by examining the proportion of relationships that actually occurred and by compiling sociometric networks showing how many of the scientists in the group are linked to one another directly or through a common link with other individuals [11].

Moreover, Crane states that the findings from various studies "indicate[s] clearly the presence of an invisible college or network of productive scientists linking separate groups of collaborators within a research area" [11, p. 54]. What are the implications of social circles and invisible colleges or networks in hybrid research organizations such as UIRCs and the Ontario Centres, which consist of university and industrial scientists? The creation and funding of UIRCs or Centres of Excellence by government, or internal Organized Research Units (ORUs), or Research Centres by universities, is intended to make "invisible colleges," or scientific networks, visible. In the case of the Ontario Centres, by making many invisible scientific colleges visible, governments can use the output of these networks (technology transfer) to show to constituents that their tax dollars are being put to good use in enhancing the competitiveness of Ontario industry by strengthening basic research in universities. However, what about other more numerous, but less visible, scientific colleges that exist but that do not happen to receive any type of *targeted* government funding? Do university and industrial scientists not get together in these invisible scientific colleges, and does technology transfer not take place?

Methodology and Data Collection

To determine whether or not targeted government funding as received by the Ontario Centres makes a difference in the level and types of interaction of university scientists and industrial scientists, a "network analysis" of communication patterns of university and industry scientists in four of the Ontario Centres was undertaken and compared to an analogous university-industry scientific network (control group) that did not receive targeted government funding. The data collected represent a description of communication interaction between university and industrial scientists over the first two years (of a five-year contract that has since been expanded to ten years) of the lives of the Ontario Centres and over two years of the life of a control group.

According to Eveland, network analysis is essentially a "set of procedures used to reduce the complexity of a bounded and described set of communications interactions" [16, p. 17]. However, network analysis is much more than a "set of procedures" and has a long history of use in the disciplines of sociology and anthropology. According to Scott, network analysis is the proper type of analysis to be used when you have *relational* data as opposed to *attribute* data, which uses variable analysis, or *ideational* data, which uses typological analysis [40, p. 3]. Relational data are the contacts (telephone, meetings, electronic mail, letters, or memos) that relate one person to another and "cannot be reduced to the properties of individual agents themselves" [40, p. 3]. The rationale for documenting communication patterns is that it allows for three different loci of analysis. When looking at "communication patterns," we can use the *network* as the unit of analysis, the *individual* as the unit of analysis, and the *interactions* between individuals as the unit of analysis.

Network identification and data collection was undertaken between December 1989 and June 1990. A survey approach was used to collect the data. The survey instrument was an adapted version of the one used by Eveland [16, p. 22] containing additional satisfaction variables [3, pp. 181-182]. The survey method was deemed to be the best approach because the smallest Centre had at least 65 participants, while the largest Centre had almost 400 participants. Centre members were instructed to think back to the inception of the Centre (January 1988) and describe their communication interactions with other members (administrators, principal investigators, other academic staff, industrial members) since that time. Respondents were asked to indicate, given their best recollection, the frequency of interaction (in a range from weekly or more often, to once or twice per year), the methods of interaction (face-to-face informal meetings, letter or memo, telephone, formal scheduled meetings, electronic mail, and fax), and the topics of interaction (general administrative issues, specific R & D project, and general technical issues). This article reports on the results with respect to the frequency of interaction and the satisfaction with the frequency of interaction.

In terms of communication patterns between industrial and university scientists, it is not known what would or should be considered a "normal" level of interaction. The methodology used to determine the composition of the control group was as follows. Names of all faculty members of Ontario universities whose *departments and disciplines* were applicable to the four Ontario Centres in the study were extracted from the *Commonwealth University Faculty Yearbook, 1988-89.* The names of faculty who were members of the four Ontario Centres in the study were deleted from the list, and letters were sent to the remaining names (1,692) requesting participation in the control group if the person had an ongoing relationship with industry in the form of research grants and/or contracts.[7] Persons in the latter group were asked to provide a list of their corporate research contacts.

Responses were received from 44 of the 1,692 faculty who received letters, giving a return rate of 2.6 percent. Of the 44 who responded, only 16 (36.4 percent) were willing to provide a list of their corporate research contacts and were included in the network. The total number of corporate research contacts provided was 87. In contrast to data collection in the Ontario Centres, which took place between December 1989 and June 1990, data collection for the control group was undertaken in September 1991. Control group members were given the same set of instructions to complete the questionnaire as network members of the Ontario Centres.

It should be kept in mind that the control group is not an exact duplicate of a specific Ontario Centre or of the Ontario Centres as a whole. There are no university-industry research centres that are not financed by government, yet are analogous to one of the government-financed Ontario Centres or the Canadian Federal Centres. In a formal sense, therefore, the control group is not a "network" in the sense that the university and industry members interact with each other in a single organization, but a collection of university researchers who have the same disciplinary backgrounds as university researchers in the Ontario Centres and who also have significant university-industry interactions.

Therefore, for the purposes of attempting to put the university-industry interaction of the Ontario Centres into some type of context, the control group as devised was deemed suitable for this purpose.

Results

A software program entitled FATCAT was used to analyze the network data. FATCAT is specially designed for network analysis and combines data describing the qualities of the relationships between people with data that describe characteristics of the people themselves [36, p. 1]. The analysis that “FATCAT performs can be described as “categorical,” in that it divides the members of the network into categories and then describes the contact between and among categories. . . . The goal of FATCAT is to uncover the relation between the data that describes the individuals and the data that describes the connections between the individuals, and to assist the user in identifying significant patterns in the link matrix” [36, p. 2].

As in most social science surveys, not all questionnaires were returned. Response rates were 59.6 percent for Centre A, 49.1 percent for Centre B, 36.5 percent for Centre C, 56.4 percent for Centre D, and 52.9 percent for the control group (Centre E).

Frequency of Interaction

Table 1 shows the number of links, and Table 2 shows the amount of interaction reported at each frequency level. In interpreting this information, it should be kept in mind that the number of *links* is different from the amount of *interaction*. The amount of interaction is determined by weighting the number of links by the frequency of interaction.[8]

The data in Table 1 show that links that take place at a *weekly or more often* level range from 14 percent to 23 percent in the Ontario Centres and 10 percent in the control group. The data in Table 2 show that the amount of interaction that is accounted for by links at the *weekly or more often* level exceeds 60 percent in all Ontario Centres, in contrast to the control group, which is at 42.8 percent. Although high frequency (*weekly or more often*) links account for a small percentage of the total number of links, they represent a high percentage of the total amount of interaction.

Principal Investigator-Industrial Member Interaction

The data in Tables 1 and 2 describe the overall levels of communication in the Ontario Centres and the control group. This level of analysis does not inform us about the interactions between Centre principal in-

TABLE 1

Number of Links at Each Frequency Level by Centre in Percentages

Frequency Levels	A \#	B \#	C \#	D \#	E \#
Once/twice per year	152	1034	516	397	102
	31.0%	55.0%	47.0%	33.0%	41.0%
Monthly/bimonthly	103	403	231	317	75
	21.0%	21.0%	21.0%	26.0%	30.0%
Once/twice monthly	120	196	162	258	50
	25.0%	10.0%	15.0%	22.0%	20.0%
Weekly or more often	114	270	184	232	24
	23.0%	14.0%	17.0%	19.0%	10.0%
Totals	489	1893	1093	1204	251

NOTE: # = number of links at this frequency level; percentages = the proportion of links accounted for by links at each frequency.

TABLE 2

Amount of Interaction at Each Frequency Level by Centre in Percentages

Frequency Levels	A Amount	B Amount	C Amount	D Amount	E Amount
Once/twice per year	152	1034	516	397	102
	1.3%	3.9%	2.8%	1.6%	2.8%
Monthly bi/monthly	824	3224	1848	2536	600
	7.2%	12.0%	10.0%	10.3%	16.7%
Once/twice monthly	3240	5292	4374	6996	1350
	28.1%	19.7%	23.6%	28.1%	37.6%
Weekly or more often	7296	17820	11776	14848	1536
	63.4%	64.4%	63.6%	60.0%	42.8%
Totals	11512	27370	18514	24747	3588

NOTE: Amount = the amount of interaction accounted for by links at each frequency level; percentages = the proportion of interaction accounted for by links at each frequency level.

vestigators (PI) and industrial members (I). Data on the mean strength and standard deviation of overall frequency links between principal investigators and industrial members, however, revealed large standard deviations, indicating that many Centre members are doing much more than the average and many are doing much less than the average [3, pp. 187–202]. The standard deviations are so large that it would be impossible to derive any meaningful conclusions based on comparisons between the means.

If it is impossible to derive any meaningful conclusions based on comparisons between the means, how do we illustrate the frequency of interaction between principal investigators (PI-PI), principal investigators and industry (PI-I), industry and principal investigators (I-PI), and between industry (I-I)? The data in Table 3 show the number of interactions per year between PI-PI and PI-I *as initiated by PIs*, and the number of interactions per year between I-PI and I-I *as initiated by Is*.

The largest proportion of interaction initiated by PIs that is accounted for by interaction between PI-I is in the control group at 96.6 percent, whereas the largest proportion of interaction initiated by Is that is accounted for by interaction between I-PI is in Centre B at 48.8 percent. The very high proportion of interaction that is accounted for by interaction between PI-I in the control group and the very low proportion of interaction that is accounted for by interaction between PIs in the control group can be attributed to the fact that the control group is composed of PIs that have *individual* university-industry linkages and do not have formal departmental or institutional ties to each other. It is probable that the number of interactions that did happen between PIs (38) in the control group is due to chance.

Based solely on the data in Table 3, comparisons between the Ontario Centres and the control group can be problematic, because the number of interactions per year is distorted by the number of university and in-

TABLE 3

Number of Interactions per Year between Centre Principal Investigators and Industrial Members (PI-I), Principal Investigators (PI-PI), and Industrial Members (I-I)

	PI-PI	PI-I	Total PI	I-I	I-PI	Total I
Centre A						
Interactions	2,098	84	2,182	452	178	630
Percentage	96.2%	3.8%	100%	71.8%	28.2%	100%
Centre B						
Interactions	1,493	470	1,963	644	614	1,258
Percentages	76.1%	23.9%	100%	51.2%	48.8%	100%
Centre C						
Interactions	1,675	340	2,015	3,061	343	3,404
Percentages	83.1%	16.9%	100%	89.9%	10.1%	100%
Centre D						
Interactions	3,156	1,787	4,943	16,132	1,773	17,905
Percentages	63.9%	36.1%	100%	90.1%	9.9%	100%
Centre E						
Interactions	38	1,081	1,119	2,003	466	2,469
Percentages	3.4%	96.6%	100%	81.1%	18.9%	100%

dustry personnel in each Centre. To create a more precise measurement to allow for meaningful comparisons between Centres, the number of interactions per year between PI-PI, PI-I, I-I, and I-PI was converted to approximate per capita values.[9] In terms of the interaction initiated by principal investigators to industrial members, the data in Table 4 show that three out of four of the Ontario Centres *do not* exceed the per capita value of the control group at 1.80 interactions. The only Ontario Centre that exceeds the per capita value of the control group is Centre B, which at 4.35 interactions is over twice as high. This is a very interesting difference and will be discussed more thoroughly later. In terms of interaction initiated by industrial members to principal investigators, the data illustrate that all Ontario Centres *do* exceed the per capita value of the control group at 0.78 interactions for each I and PI member, although Centre D is only slightly higher at 0.81 interactions. This is also a very interesting difference, because the data show that industry initiated communication is more prevalent in the Ontario Centres (with the exception of Centre D) compared to the control group.

It is not clear from the data presented in Tables 3 and 4 that the Ontario Centres have higher levels of interaction between university and industry compared to the control group. Some Ontario Centres have lower levels of interaction on some measures compared to the control group, whereas other Centres (notably Centre B) do not. As shown in Table 3, interaction initiated by PI between PI-I is substantially less in the Ontario Centres compared to the control group, but this difference may be due to the nature of the composition of the control group. Interaction initiated by I between I-PI is notably higher in Centre A (28.2%) and Centre B (48.8%) compared to the control group. The number of per capita interactions between PI-I in Centre B is over twice as large as the control group (Table 4). The number of per capita interactions between I-PI in Centre B is over 7 times as large as the control group.

Satisfaction with Frequency of Interaction

The aggregate level of interaction does not take into account the satisfaction or lack of satisfaction with any level of interaction. In the Ontario Centres that have lower levels of interaction compared to the control group it is possible, however, that principal investigators as well as industrial members may be satisfied with the extent of their interaction. The communication questionnaire asked about satisfaction with the frequency of interaction with each Centre member.[10] In terms of the satisfaction with the frequency of interaction between PI-I, the data in

TABLE 4

Number of Interactions per Year and per capita Number of Interactions per Year, between Principal Investigators (PI-PI), Principal Investigators and Industrial Members (PI-I), between Industrial Members (I-I), and Industrial Members and Principal Investigators (I-PI)

	PI-PI	PI-I	I-I	I-PI
Centre A	2,098	84	452	178
Per Capita	58.30	1.00	2.31	2.11
Centre B	1,493	470	644	614
Per Capita	18.43	4.35	4.47	5.69
Centre C	1,675	340	3,061	343
Per Capita	16.75	1.36	4.90	1.37
Centre D	3,156	1,787	16,132	1,773
Per Capita	7.89	0.82	1.36	0.81
Centre E	38	1,081	2,003	466
Per Capita	0.17	1.80	1.25	0.78

Table 5 show that the highest level of satisfaction is in Centre D at 7.00, while the lowest level of satisfaction is in Centre B with a score of 3.52. It is interesting to note that the high level of satisfaction with PI-I interaction in Centre D seems at odds with the data in Table 4, which shows Centre D with the lowest level of per capita interaction between PI-I (0.82). In addition, the lowest level of satisfaction with PI-I interaction in Centre B is also at odds with the data in Table 4, which show Centre B with the highest level of per capita interaction.

In terms of the satisfaction of interaction between I-PI, the data are the same as above: the highest level of satisfaction is in Centre D with a score of 6.26, and the lowest level of satisfaction is in Centre B with a score of 4.64. The largest difference between the scores of PI-I and I-PI is in Centre A, where the difference between the scores is 1.69; the second largest difference between the scores of PI-I and I-PI is in the control group, where the difference between the scores is 1.60. In all Centres, with the exception of Centre D, it is clear that industrial scientists are more satisfied with their level of interaction with university scientists than university scientists are satisfied with their level of interaction with industrial scientists.

To further interpret the extent of satisfaction of interaction, Table 6 was constructed to show the percentage of links accounted for at each satisfaction level by status and Centre. The important part of the table is the percentage of links coded 0 (*not at all satisfied)* or 1 (*some satisfaction).* In terms of the satisfaction of principal investigators, the data show that 21.05 percent in Centre A indicated that they were "not at all

TABLE 5

Mean Satisfaction Rating and Standard Deviation of the Frequency of Interaction between Principal Investigators (PI-PI), Principal Investigators and Industrial Members (PI-I), Industrial Members (I-I), and Industrial Members and Principal Investigators (I-PI) by Centre

	PI-PI	PI-I	I-I	I-PI
Centre A	4.44	3.71	6.51	5.40
SD	3.69	3.49	3.00	3.14
Centre B	6.19	3.52	3.85	4.64
SD	2.99	3.15	3.17	3.65
Centre C	5.43	4.24	4.78	5.26
SD	3.45	3.08	3.39	3.60
Centre D	6.71	7.00	7.30	6.26
SD	2.88	2.79	2.68	3.05
Centre E	6.00	4.04	5.15	5.64
SD	2.45	3.38	3.20	2.93

satisfied" or had "some satisfaction" with their level of interaction with industry; 10.24 percent in Centre B; 8.4 percent in Centre C; 8.01 percent in Centre D; and 9.26 percent in the control group. In terms of the satisfaction of industry members, the data show that 9.39 percent in Centre A indicated that they were "not at all satisfied" or had "some satisfaction"; 14.2 percent in Centre B; 11.33 percent in Centre C; 7.44 percent in Centre D; and 19.75 percent in the control group. Thus, the lowest level of satisfaction in terms of PI-I interaction is found in Centre A, and the lowest level of satisfaction of I-PI interaction is found in the control group.

Discussion

This study reports on the results of a network analysis of communication interaction between university and industrial scientists in four Ontario Centres. It attempted to determine, given the different research orientations of industry and university scientists, whether university scientists included industrial scientists in their communication networks and whether the four Ontario Centres, which are formally and deliberately established scientific structures, engender communication behaviour and technology transfer results that are different from traditional university-industry scientific structures.

Table 7 contains a summary of the findings and is helpful in assessing the degree to which the above questions have been answered. The results show that Centre A has a very low level of PI-I interaction but a

TABLE 6

Percentage of Links Initiated by Principal Investigators and Industrial Members by Satisfaction Level and by Centre

		PI	I	Total
Centre A	0	0.00%	0.90%	0.55%
	1	21.05%	8.49%	13.74%
	4	25.00%	34.91%	30.77%
	9	53.95%	55.66%	54.95%
Centre B	0	2.33%	0.00%	1.30%
	1	7.91%	14.20%	10.68%
	4	38.14%	40.24%	39.06%
	9	51.63%	45.56%	48.96%
Centre C	0	0.80%	0.39%	0.59%
	1	7.60%	10.94%	9.29%
	4	35.60%	37.89%	36.76%
	9	56.00%	50.78%	53.36%
Centre D	0	0.72%	1.84%	1.46%
	1	6.29%	5.60%	5.84%
	4	31.12%	27.73%	28.88%
	9	61.87%	64.83%	63.83%
Centre E	0	0.00%	2.55%	1.90%
	1	9.26%	17.20%	15.17%
	4	42.59%	41.40%	41.71%
	9	48.15%	38.85%	41.23%

much higher level of I-PI interaction. It also has the highest percentage of university scientists who are not satisfied with their level of interaction with industry and presumably may want to increase their satisfaction by reaching out to industry on a more systematic basis. One may also ask whether university scientists in Centre A are still continuing to do business in the same way but are slowly realizing that they must change and establish links with industry, especially if they want to keep targeted funding. Centre B has a reasonable level of PI-I interaction and an excellent level of I-PI interaction, but the data also show that university scientists in the Centre are not satisfied with this level of interaction. The question arises, why do university and industry scientists in Centre B have such a high level of interaction? This interesting difference in level of interactions between Centres may be due to the fact that when Centre B was initiated, Centre B management *required* that industrial scientists *formally* participate and be active participants in the research projects initiated in the Centre. Centre C has a fair level of PI-I interaction and a poor level of I-PI interaction. Centre D has an excellent level of PI-I interaction and a very poor level of I-PI interac-

TABLE 7

Summary of University-Industry Interaction in the Ontario Centres and the Control Group

	PI Initiated Interaction	I Initiated Interaction
A. Number of interactions per year between PI-I and I-PI	highest PI-I interaction is in Centre D	highest I-PI interaction is in Centre B
	no Ontario Centres have higher PI-I interaction than the control group	2/4 Ontario Centres have higher I-PI interaction than the control group
B. Number of interactions per capita	highest per capita PI-I interaction is in Centre B	higher per capita I-PI interaction is in Centre B
	1/4 Ontario Centres have higher per capita PI-I interaction than the control group	all Ontario Centres have higher per capita I-PI interaction than the control group
C. Mean satisfaction of frequency of interaction	highest mean satisfaction for PI-I interaction is in Centre D	highest mean satisfaction for I-PI interaction is in Centre D
	2/4 Ontario Centres have higher PI-I mean satisfaction scores compared to the control group	all Ontario Centres have higher I-PI mean satisfaction scores compared to the control group
D. Satisfaction level (% coded 0 or 1)	Centre A has highest percentage of PIs who are not satisfied with their links with industry	Centre E (control group) has the highest percentage of Is who are not satisfied with their links with university scientists
	Centre D has lowest percentage of PIs who are not satisfied with their links with industry	Centre D has the lowest percentage of Is who are not satisfied with their links with university scientists

tion, although the per capita level of PI-I and I-PI interaction is the same in Table 6, and the PIs and Is in Centre D have the highest mean satisfaction rating with frequency of interaction. In addition, Centre D has the lowest percentage of university scientists and industrial scientists who are not satisfied with their links with each other. The control group (Centre E) has an excellent level of PI-I interaction and a reasonable level of I-PI interaction. However, it also has the highest percentage of industrial scientists that are not satisfied with their links with university scientists. Thus, the Ontario Centres, which are formally and deliberately established scientific structures, do engender communication behaviour that is different from a traditional university-industry scientific structure (control group), but the differences depend on which measure one looks at and which Centres one compares.

The traditional university-industry scientific structure (control group) that was created for this study was an attempt to provide some context or a reference point for assessing the level of university-industry communication in the Ontario Centres. For that purpose it was useful. However, the main problem in constructing a viable university-industry control group is that unfunded (directly by government), highly specialized university-industry research centres that are similar to the Ontario Centres do not exist.

A question that still needs to be answered is, what do the resultant levels of communication interaction mean for technology transfer and the Ontario Centres? Given that one of the objectives of the Ontario Centres is the transfer and diffusion of technology to industry, how can the success of this objective be assessed? Is there a relationship between the level of communication between university and industry and the amount of technology transfer? Is it appropriate to speak about the "amount" of technology transfer when technology transfer can be defined in both *organizational* and *functional* terms? Does more or less university-industry communication mean more or less technology transfer? The levels of university-industry communication observed in this study could be characterized as reasonable, given that the snapshot was taken when the Ontario Centres were two years old. But will these levels of university-industry communication facilitate the longer-term development of effective university-industry linkages and produce technology transfer "results" in the Ontario Centres? For that assessment the jury is still out. The network analysis of the communication interactions of principal investigators and industrial members in four of the Ontario Centres contributes to a preliminary assessment of the *organizational forms* of technology transfer taking place in the Ontario Centres and shows that many Ontario Centres can make significant improvements in their interaction with industry.

Should the creation of the Ontario Centres serve as a model for university-industry research linkages? This is a difficult question to answer because UIRCs are created for a variety of reasons. The early NSF Cooperative Research Centers had an applied focus and were designed to pay their way after a few years of government start-up funding. The NSF Engineering Research Centers also have an applied focus. The NSF Science and Technology Centers are the model that is most similar to the Ontario Centres in that they focus on "pre-competitive" research. The Ontario Centres model for conducting university-industry research is an organizational innovation, because the Centres are interdisciplinary as well as multi-university and focus on fundamental as opposed to applied research. Faculty who work in the Ontario Centres still hold their appointment in a university and have been very successful in sustaining or increasing their "traditional" linkages with basic research — if basic research is measured as the number of dollars awarded to a principal investigator via disciplinary committees from national granting councils.

The Ontario Centres are also financed in an innovative fashion. Setup as nonprofit corporations, the Ontario Centres are financed by five-year government contracts but are independent of both government and universities. This type of legal relationship has some benefits and some costs. In terms of benefits, there is less chance of interference from an individual university that is a member of the Centre (five out of seven Centres are multi-university), and in terms of costs, the interdisciplinary, multi-university nature means that it is very difficult to keep open the channels of communication between universities, within universities, and between universities and industry.

When the Ontario Centres complete their contracts (1997), the question remains whether this significant public investment (C$ 420 million) in university research in Ontario has led to significant increases in the *functional forms* of technology transfer compared to traditional (unfunded) university-industry scientific structures, or whether government funding for Centres of Excellence, Engineering Research Centres, and Science and Technology Centres is a hidden industrial policy that funnels research subsidies to industry (mostly Fortune 500 companies) through universities [13, p. 85]. The question whether the Ontario Centres and other UIRCs actually contribute to economic competitiveness also persists. Writing in 1990, Tornatzky and Fleischer stated that "there is relatively little to indicate that cooperative science has yet produced large amounts of commercial outcomes, although we are probably too early in the history of these programs to make any definitive statements" [43, p. 69]. Five years have passed since the above statement was published, and significant progress has not been made in analyzing the outcomes of UIRCs, even though many UIRCs are now mature organizations and ripe for analysis. Can we measure the extent to which economic competitiveness has been enhanced at the level of the firm, or at the regional or national level, because of investments in the Ontario Centres and other UIRCs? Data from the UIRCs indicate that at the level of the firm, there is significant follow-on investment in research and development by participant companies [34]. No studies have been undertaken, however, to assess the extent to which investments in UIRCs enhance competitiveness at the regional or national level. It will be difficult to attribute investments in the Ontario Centres or UIRCs to positive changes in the competitiveness of firms or to enhanced competitiveness regionally or nationally, given that there are a multitude of factors, such as the pace of technological change in industry, the cost of labour, the impact of patents, copyrights, and trade-marks, and so on, that need to be taken into account in assessing competitiveness.

Mansfield has completed some exploratory work on the linkages between academic research and industrial innovation and has found that, "particularly in industries like drugs, instruments, and information processing, the contribution of academic research to industrial innovation has been considerable" [27, p. 11]. However, he concluded with a statement that is worth reflecting upon, especially where the rhetoric of university-industry research linkages is concerned: "the rationale for academic research extends far beyond the sorts of narrowly defined economic benefits considered here. Obviously, knowledge concerning the universe is important for its own sake, and the education of students, which occurs in many academic research projects, is socially important as well" [27, p. 12].

Notes

[1] The Ontario Centres of Excellence (COE) will hereafter be referred to as the Ontario Centres.

[2] The NSF call their UIRCs University-Industry Cooperative Research Centers (UICRC). However, they will be referred to as UIRCs.

[3] The terms "network analysis," "applied network analysis," and "communication networks" are synonymous.

[4] In September 1991 the New Democratic Party was elected as the governing party in the Province of Ontario. Subsequently, the Premier's Council on Technology was declared defunct, but a new council, entitled the Premier's Council on Economic Renewal, has emerged with much of the same mandate as the Premier's Council on Technology.

[5] For a discussion of what constitutes basic or fundamental research, precompetitive research (long-term applied), competitive or short-term applied research, or developmental research, see The Canadian Institute for Advanced Research. *Innovation and Canada's Prosperity: The Transforming Power of Science, Engineering, and Technology*. Toronto: Canadian Institute for Advanced Research, October 1988), 18-20.

[6] In contrast to the United States and many other countries, Canadian universities only charge and receive "overhead" revenue from research contracts. Research contracts are a small part of the total research enterprise in Ontario universities. Overhead is not provided on research grants (provided by federal granting agencies, SSHRC, NSERC, and MRC) which make up the vast majority of the research enterprise in Canada.

[7] It was possible that faculty who were members of the three Ontario Centres who did not participate in the study were on the list to which letters were sent. However, only one response was received from a person in this category, and it was not used.

[8] If a respondent indicated interacting at the level of "once or twice per year," this was converted to 1 interaction per year; interaction "monthly or bi-monthly" was converted to 8 interactions per year; interaction "once or twice per month" was converted to 27 interactions per year; and interaction "weekly or more often" converted to 64 interactions per year. This transformation gives a rough approximation of the actual number of interactions per year.

[9] In order to operationalize this, the PI-PI total for each Centre was divided by the square of the number of PIs in each Centre. The I total in each Centre was divided by

the square number of Is in each Centre. The PI-I total and the I-PI total in each Centre were divided by the product of the number of PIs and the number of Is in each Centre.

[10]As coded on the questionnaire, the relative values of the satisfaction variable do not stand in relation to one another. Data transformations were necessary to ensure that the relative values of variables as collected could stand in relation to one another. The data were re-coded according to the following scheme: "not at all satisfied," was converted from 1 to 0 to represent no satisfaction; "some satisfaction" was converted from 2 to 1; "a great deal of satisfaction" was converted from 3 to 4; and "completely satisfied" was converted from 4 to 9. This transformation spreads out the original coding scheme so that the relative values now stand in relation to one another.

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In-Migration of College Students to the State of New York

The interstate migration of college students influences college admissions policy, student body composition, and ultimately the labor force of a state, as noted by Abbott and Schmid [1]. The tuition differential between resident and nonresident reduces the college choices of student migrants [13]. Some college administrators oppose such policies against out-of-state students without considering the possible consequences. The Virginia State Council of Higher Education [22] reported that in-migration of students may contribute to maintenance of enrollment levels despite the projected decline of Virginia's college age population. Student migrants tend to work in the state where they obtained their higher education, thus they become an educated labor force for that state [13]. The purpose of this study is to provide a better understanding of the interstate migration of students. To this end I estimated a model for in-migration of college students to the state of New York to examine the effects of migration determinants associated with various characteristics of student migrants' home states.

College Students and Migration

Differences in student characteristics between states will affect student migration patterns. Studies of migrant and nonmigrant students

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reveal that migrants are academically more talented, have higher educational expectations, and have a better socioeconomic background [8, 9, 10]. Fenske et al. [8, 9] found that migrants obtained higher ACT (American College Test) composite scores relative to local attenders, and they emphasized institutional quality as a basis for their choice of college, while putting less importance on cost factors. A similar finding was also obtained by Ferriss [10].

Abbott and Schmid [1] found that the majority of first-time undergraduates in major private universities in the United States were out-of-state migrants, whereas in major public universities migrants represented a low percentage. Similarly, the majority of graduate migrants from Virginia attended private institutions [22]. The Virginia State Council of Higher Education [22] also reports that 87 percent of migrants from Virginia who were in professional programs attended private institutions in the District of Columbia.

The importance of the quality of education seems to increase with the level of education, because it is considered a part of the career [1]. Thus graduate student migrants are more concerned about the quality of an institution. A concomitant finding is shown in Bayer's study [3] of science doctorate recipients, which showed that those who migrated attended better universities than those who did not.

Abbott and Schmid [1], however, found that the quality factor alone was a modest determinant to account for interstate migration of first-time undergraduates in the major universities in the United States. When they controlled the effects of state size and distance, the quality factor represented a modest significant variable. Admission policies, such as restrictive admission requirements and quotas, have acted as a barrier to student mobility [5, 10].

A state's tuition policies also play a significant role. Charging higher fees to out-of-state students may have a significant influence on the type of students who enroll. College costs were statistically significant for low-income student groups, but they were insignificant for other income groups [12]: low income students are more likely to attend home state institutions. Carbone [5] suggests that migrants put greater importance on the prestige and reputation of an institution and are thus willing to pay higher tuition.

According to Christal and his associates [6], costs and financial aid policies might be partly the reasons why 87 percent of all first-time students in Southern states remained in their home state in 1979; state-supported financial aid is usually not portable, whereas federal financial aid is. Scholarship availability acts as a pull factor for attracting graduate migrants [9, 10]. Fenske and his associates [9] found that migrants tended to be academically more talented based on undergraduate GPA (grade point average) compared to nonmigrants, and they were also awarded graduate assistantships.

Geographical proximity appears to have a significant influence on student migrants. According to Christal [6], the majority of first-time freshmen out-migrants migrated to adjacent states and stayed in the same region. A similar finding was provided by the report of the Virginia State Council of Higher Education [22]. In the case of Virginia, over 51 percent of the out-migration in the fall of 1979 was to states neighboring Virginia (e.g., District of Columbia, Maryland, North Carolina, Tennessee, Kentucky, and West Virginia).

A Model of Student Interstate Migration

The factors affecting the number of student migrants described above are analyzed in more detail by variables associated with the following characteristics: test scores, per capita incomes, expenditure per student, admit rates, the number of potential migrants, and geographical distance. Interstate migration studies have often used the log-linear form to obtain elasticity estimates [11]. In this study, the elasticities of the variables on the students' in-migration to New York are thus derived from the following model in log-linear form:

$$\begin{aligned}\mathrm{logINMIG}_{ij} = {} & \mathrm{b1} + \mathrm{b2logEXPD}_i + \mathrm{b3logSAT}_i + \mathrm{b4logPINC}_i \\ & + \mathrm{b5logADMIT}_i + \mathrm{b6logGRADS}_i + \mathrm{b7logDIST}_i\end{aligned}$$

where the variables are defined as follows:

INMIG_{ij} = the number of first-time students from state i enrolled in public and private institutions in New York in 1986; student type j: undergraduates (freshmen and transfers), professionals, and graduates.
EXPD_i = educational and general expenditures per full-time equivalent student in public four-year institutions in state i in 1986-87.
SAT_i = the average SAT scores of high-school graduates in state i in 1987-88.
PINC_i = disposable personal income per capita (in current dollars) in state i in 1986.
ADMIT_i = the average admit rate (in percentages) in public four-year institutions during 1987-88 in state i.
GRADS_i = the number of high-school graduates in state i in 1989-90.
DIST_i = the distance (in miles) from the largest city of state i to New York.
b1-b7 = the empirically estimated parameters.

Because the New York State Department of Education [15] provided detailed 1986 data of students' migration flow from origin states to the state of New York, I chose New York as the only destination. Considering in-migration patterns, the student migration process is viewed as a function of the characteristics of origin states. The dependent variables are the number of first-time in-migrating undergraduates, first-time professionals, and first-time graduates to the state of New York.

The SAT (Scholastic Aptitude Test) score provides a measure of academic ability. Using the Sawyer and Brounstein conversion table [17], the ACT (American College Testing Program) composite scores for states with a small percentage of SAT use [7, 20] are converted to the SAT Total test scores (SAT). The geographic mobility tends to be high for the students with higher academic ability [8, 9, 10]. Thus, the number of migrating students is hypothesized to be positively related to SAT scores (SAT).

Socioeconomic characteristics influence the propensity to migrate. Per capita disposable income (PINC) [19] is a proxy for socioeconomic characteristics. Thus, it is hypothesized that the number of migrating students is positively related to per capita income (PINC).

Institutional quality, in this study, is measured as E & G (educational and general) expenditures per FTE (full-time equivalent) student in public four-year institutions (EXPD) [21]. State institutions with higher E & G expenditures per student are likely to cause lesser number of students to leave their home states. Thus, the number of migrating students is hypothesized to be inversely related to E & G expenditures per student (EXPD).

Institutional admit rate is used as a proxy for admission policies: admit rate measures are derived from the average of admit rates in public four-year institutions for origin states (ADMIT) [2]. The higher the admit rate in a state, the lesser will be the number of migrants. Thus, the number of migrating students is hypothesized to be inversely related to admit rates (ADMIT).

College-bound segments not only affect admission policies but also influence the number of students who arrive in receiving states [1]. College-bound segments are measured as states' graduating classes (GRADS) [7]. Thus, it is hypothesized that the number of migrating students is positively related to college-age cohort size (GRADS).

The distance (DIST) variable is a proxy for the geographical proximity, and to reduce error [1], its reference points are based on a state's largest cities (by population) rather than on its geographic centers, assuming that the majority of migrants come from the state's largest population centers. The Zipf model formulation of gravity relationship [10] can be directly expressed by double-log form specification [1]. The distance variable is measured in miles based on the state maps and mileage charts [16]. Student migrants tend primarily to migrate to the bordering states [6, 22]. Thus, the number of migrating students is hypothesized to be inversely related to distance.

Empirical Results

Considering student migrants to the state of New York, forty-six origin states are analyzed, after excluding missing information as well as New York. The Chow test for subgroups of students (undergraduate, professional, and graduate) indicates that the coefficients of the subgroup models are different; the results for those groups are summarized in Table 1. Overall, the models well explain student migration to New York, as indicated by the high adjusted R-square values. Also, heteroskedasticity is not present. There is some evidence of multicollinearity, such as per capita income and distance to New York, and per capita income and SAT scores (see the Appendix). Multicollinearity lessens the efficiency of an estimator by inflating its standard errors. This consequence is not a serious problem, however, because overall coefficients are statistically significant, and the models account for a high portion of the variance in the number of student immigrants attending college in New York.

E & G expenditures per student, a proxy for origin states' institutional quality, have coefficients of the expected sign for both the undergraduate and graduate equations, although neither coefficient is sig-

TABLE 1

Regression Analyses for In-Migration of College Students to New York

	Undergraduates	Professionals	Graduates	Total
Expenditure per student	−0.8678 (−1.5407)	0.0423 (0.0776)	−0.2145 (−0.4547)	−0.6476 (−1.2947)
Average SAT score	6.6606** (2.4287)	3.9361 (1.4820)	3.0629 (1.3339)	5.7449** (2.3588)
Per capita disposable income	2.3070** (2.2450)	1.9365* (1.9458)	2.2788** (2.6485)	2.1362** (2.3408)
High-school graduates	0.6411** (6.7302)	0.5939** (6.4372)	0.6916** (8.6716)	0.6417** (7.5852)
Admit rate	−1.7750* (−1.9500)	−1.6837* (−1.9099)	−0.8390 (−1.1009)	−1.5637* (−1.9343)
Distance	−0.4749** (−3.6934)	−0.3375** (−2.7102)	−0.3216** (−2.9870)	−0.4313** (−3.7774)
Constant	−49.6540** (−2.9613)	−39.2510** (−2.4171)	−37.5590** (−2.6753)	−44.6480** (−2.9984)
Adjusted R-Square	0.8503	0.8062	0.8355	0.8608
Standard Error	0.5898	0.5712	0.4938	0.5238

NOTE: t-statistics are in parentheses.
*Significant at or below the 0.05 level. **Significant at or below the 0.01 level.

nificant. The weakness of this variable suggests that states' differences in expenditures per student for public higher education do not strongly influence interstate migration of students. It may be that these expenditures also reflect cost-of-living differentials.

The academic ability of an origin state's high-school senior class (measured as average SAT scores) is a major migration-inducing factor for undergraduates. The large coefficients for the SAT score variable have the expected sign, indicating that the number of undergraduates who migrate to New York is very responsive to the SAT scores of the origin state's high-school class. States with higher SAT scores are more likely to lose their resident students than states with relatively lower SAT scores. This is presumably due to the fact that students with higher academic ability have higher academic aspirations and pursue wider choices of colleges, including out-of-state institutions. These students are therefore more geographically mobile than students with less ability.

Per capita income has a large and significant influence on all student groups. For example, a 1 percent increase in an origin state's per capita income would increase the number of undergraduate migrants by 2.31 percent, professional migrants by 1.94 percent, and graduate migrants by 2.28 percent. The results also indicate that the first-time undergraduate migrants are slightly more responsive to income than either professional or graduate students. The socioeconomic characteristics of families may play a more critical role in the migration decision of college-bound seniors than they do subsequently at the professional and graduate level.

A positive and significant relationship between the number of migrating students and the origin state's graduating class size was found for all student groups. States with a larger college-age cohort are likely to have a greater number of student migrants. The likely first-time college-bound segment for each state seems to represent a "supply" factor affecting the number of undergraduates, professionals, and graduates who arrive in receiving states.

The average admit rates in public four-year institutions for origin states, a proxy for college admission policies, has a statistically significant effect. The coefficients of the institutional admit rate have the expected signs for all student groups. The large coefficients for the admit rate variable indicate that the number of undergraduate and professional immigrants attending in New York is responsive to origin states' admit rate variations. The negative sign on the admit rate variable suggests that states with higher institutional admit rates are less likely to lose their resident students than the states with relatively lower admit rates. The results also indicate that admit rates are more likely to affect undergraduate migration than professional and graduate migration.

The coefficients of geographic distance have the expected signs and are statistically significant for all student groups. Geographic distance has a slightly larger deterrent effect on undergraduate migration (−0.4749) than on professional (−0.3375) and graduate migration (−0.3216). The implication is that both professional and graduate migrants are likely to migrate a longer distance than undergraduate migrants, presumably because professional and graduate migrants tend to have higher educational and career goals.

Discussion

The regression results indicate that student migration to New York is very responsive to the origin states' test scores, per capita incomes, and admit rates. Some of the dynamics of the factors are different for various student groups. The effect of the origin states' income and admit rates is slightly greater for the undergraduate group than for the professional and graduate groups. The higher the per capita income in a state, the greater will be the number of student migrants out of that state, particularly among undergraduates; the higher the admit rate in an origin state's public institutions, the lesser will be the number of student migrants out of that state.

The effects of age-cohort size and geographical proximity to New York are also significant for all student groups. However, geographic distance appears to have a slightly greater deterrent effect on undergraduate migration than on professional and graduate migration, suggesting that professional and graduate students are more mobile than undergraduates and that mobility appears to vary with education level.

The findings in this study indicate the comparable nature of migration forces affecting college student and labor migration. Just as economic factors (e.g., income, wages, and employment opportunities) are the major migration determinants of labor migration [4, 14, 18], economic factors were found to be significant determinants of student migration. The present analysis, based on 1986 New York State migration data, indicates the importance of the characteristics of student migrants' home states, including states' education policies, in explaining interstate migration of college students. Further investigation of these effects requires data that include in detail comprehensive migration flows from origin states to the receiving states. Such data would allow a significant advancement in student migration research.

APPENDIX

TABLE 1

Correlation Matrix for Undergraduate Students

	UNGRAD	EXPD	SAT	INC	GRADS	DIST
EXPD	0.157					
SAT	0.608	0.241				
INC	0.782	0.246	0.700			
GRADS	0.484	0.044	0.048	0.182		
DIST	−0.722	−0.140	−0.458	−0.636	−0.033	
ADMIT	−0.707	−0.437	−0.461	−0.705	−0.121	0.717

TABLE 2

Correlation Matrix for Professionals

	PROFEL	EXPD	SAT	INC	GRADS	DIST
EXPD	0.255					
SAT	0.558	0.241				
INC	0.751	0.246	0.700			
GRADS	0.522	0.044	0.048	0.182		
DIST	−0.670	−0.140	−0.458	−0.636	−0.033	
ADMIT	−0.714	−0.437	−0.461	−0.705	−0.121	0.717

TABLE 3

Correlation Matrix for Graduate Students

	GRAD	EXPD	SAT	INC	GRADS	DIST
EXPD	0.184					
SAT	0.524	0.241				
INC	0.730	0.246	0.700			
GRADS	0.622	0.044	0.048	0.182		
DIST	−0.622	−0.140	−0.458	−0.636	−0.033	
ADMIT	−0.636	−0.437	−0.461	−0.705	−0.121	0.717

TABLE 4

Correlation Matrix for Total Student Group

	INMIGR	EXPD	SAT	INC	GRADS	DIST
EXPD	0.170					
SAT	0.596	0.241				
INC	0.776	0.246	0.700			
GRADS	0.518	0.044	0.048	0.182		
DIST	−0.710	−0.140	−0.458	−0.636	−0.033	
ADMIT	−0.703	−0.437	−0.461	−0.705	−0.121	0.717

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Review Essay

The Contradictory College: The Conflicting Origins, Impacts, and Futures of the Community College, by Kevin J. Dougherty. Albany: State University of New York Press, 1994. 315+ pp. $64.50 (21.95)

BARBARA K. TOWNSEND

As a former community college faculty member and a current enthusiast of the community college, I was prepared to be critical of Kevin Dougherty's *The Community College.* I thought it would be one more elitist critique denigrating the institution for not being more like a four-year school. After reading it, I believe it is a "must read" book for all who seek to understand factors influencing the development of the community college.

Dougherty's purpose is to "resolve the debate between the critics and defenders of the community college" (p. 7) on the fundamental issues of the institution's origins, impacts, and missions. To achieve this purpose, he delineates the major and oppositional positions on three questions: (1) what are the community college's impacts on students, business, and elite universities, (2) what are the origins of the community college, and (3) what are the origins of its current emphasis on occupational education? As part of his resolution, he acknowledges the centrality of the institution's "contradictory nature" (p. 8). Its originating purposes were often conflicting; so too are its current ones, thus leading to contradictory effects.

Dougherty devotes Section 1, the first two chapters, to recognizing the importance of the community college, specifying the three key issues debated in discussions of the community college, and outlining the major positions on these issues. He shows how the positions connect to three schools of thought: the pluralist functionalism of the functionalist advocates of the community college, and the instrumentalist

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Marxism and institutional theory of the critics. Individuals unfamiliar with these positions and the works that embody them should read this book as an excellent introduction to them. Those already familiar with the works referenced will appreciate the clarity and succinctness with which Dougherty presents the various and opposing perspectives.

Dougherty also briefly states in this section his contribution to the debate: how state relative autonomy theory "subsumes and transcends their arguments" (p. 16). According to state relative autonomy theory, state officials are relatively autonomous in their decision making. Their autonomy is only relative, however, because of two kinds of constraint. One kind is ideological, in which officials' beliefs and values influence their actions. For example, government officials who believe that everyone has a right to higher education are constrained or compelled then to support the community college for its democratization of higher education. The second constraint is resource dependence constraint, in which officials' dependence upon others' resources influences governmental decisions. Thus officials, dependent upon the resources of business interests, are motivated to support the vocationalization of community colleges to provide business with a labor force trained at the state's expense.

In the next three sections, Dougherty addresses the three key questions, indicates how each of the three schools of thought contributes to the debate on the particular question, and explains in detail how state relative autonomy can resolve the debate. Section 2 addresses the institution's impact on business and the economy, on elite state universities, and on students. According to the functionalist advocates [3, 4], the community college has had positive impacts on all three. Business and the economy have benefited by gaining needed employees, elite state universities have gained by not having to deal with ill-prepared students, and students who might not attend college otherwise have gained access to higher education. While agreeing with the institution's positive effects upon business and the economy and the universities, both the instrumentalist Marxist critics [6, 7, 9] and the institutionalist critics [1] view its effects upon students as negative. Entering higher education through the community college has a demonstrated detrimental effect upon attainment of the baccalaureate degree.

Concurring with all three schools about the effects of the community college upon students, Dougherty draws from a number of major studies "to compare community college and other institutions in their effects on *comparable* students" (p. 50). He then discusses in Chapter 4 structural factors that work against community college students attaining the bachelor's degree. This chapter is particularly important because its criticism of factors in two and four-year institutions underpins the work's later policy recommendations for restructuring the community college. Community colleges negatively affect their students' baccalaureate attainment because of the institutions' lack of residence halls, minimal academic selectivity, low institutional prestige, and emphasis on vocational education. Other structural barriers include little financial aid for transfer students and loss of credits upon transfer.

In Section 3, Dougherty answers the question about the origins of the community college by describing its origins and development at three levels: local, state, and national. The advocates of the institution maintain that it developed from a plurality of interests: parents wanting further education for their children, would-be college students seeking an institution they could get into, university representatives wanting to maintain the academic rigor of their institutions, and employers wanting employees with entry-level job skills. The instrumentalist Marxists dwell upon the influence of capitalists who desire a trained work force at little or no expense to business and who seek to maintain a stratified educational system for preservation of their own class interests. The institutionalist critics emphasize the role of the universities in preserving their niche in the higher education system.

Dougherty uses five states (California, Florida, Illinois, Indiana, and Washington) as case studies to demonstrate the important role government officials played in developing the community college. State relative autonomy theory once again comes into play. Local government officials supported the community college as a means to increase their own prestige locally, and state governors and legislators supported it as a reasonably low-cost way to train workers needed to induce business investments. Support of the institution also fit with their personal values endorsing the democratization of higher education.

Section 4 traces how the institution's curriculum became vocationalized. From the functionalist perspective, students and parental demand lay behind the curricular changes. Instrumentalists argue that capitalists pushed vocational education in order to have workers trained at little direct expense to business and industry and to maintain educational stratification. Institutionalists maintain that the decision to emphasize vocational education was made by community college leaders so that the institution would have a distinctive niche in academe. Dougherty sees these explanations as misreadings of the significance of these various interest groups. Rather, the community college became vocationalized largely because officials, at three levels of government, supported the change. Motivated not only by their implicit dependency upon the resources of business interests, government officials also were constrained by their own ideology of "the social value of aiding business" (p. 242) to support this change.

Dougherty, in Section 5, concludes by stating implications for practice and future research. Rather than support those who emphasize the noncollegiate functions of the institution [2, 5], Dougherty opts to maintain the community college's link with higher education. He urges major structural reform either through changing large two-year schools into four-year schools or through changing two-year schools into state university branches. He also urges the application of state relative autonomy theory to the study of educational change, politics of education, and political sociology.

In proposing the conversion of community colleges to four-year schools, Dougherty ignores some important realities. Although he acknowledges there might be some start-up costs in converting the two-year schools, he never addresses the costs of maintaining them as four-year schools. Given that most states appropriate less money for two-year schools than four-year schools, it is unlikely that states will want to increase their higher education costs by increasing the number of four-year schools.

Another ignored reality is the difference in the amount of financial aid received by two- and four-year students. Dougherty correctly states that community college students receive less public and private financial aid than do four-year students (p. 84). If financial aid dollars stay approximately the same, the aid that once went to two-year students would become available to four-year ones. However, the number of four-year students would increase dramatically, resulting in less money for all four-year students individually than they currently receive.

Dougherty also ignores the differing norms of two- and four-year faculty [8]. Two-year faculty who would become four-year faculty due to the conversion might adopt some four-year faculty's interest in research over students or their disinterest in marginal students, particularly if some faculty initially normed to four-year institutions join the faculty. Those two-year faculty who lack a doctorate might also lose their jobs because they lack the qualifications (read credentials) to teach in a four-year school. If permitted to teach freshmen and sophomores only, they might face lower salaries and status than more credentialed colleagues.

For these reasons Dougherty's alternative, changing community colleges into state university branches, would seem to be a more viable one. Dougherty prefers this approach largely because he believes it would facilitate students attaining the baccalaureate. Although Dougherty does not discuss the effect of this change on two-year faculty, it is likely some would prefer it to the changeover to four-year schools. Becoming a faculty member in a state university branch campus would increase their status without putting the pressure on them to earn a doctorate and conduct research. University-bound students who attend the branch campuses would also gain from this change.

However, many students attend the community college for reasons other than ultimately attaining a four-year degree. The limited research on two-year branch campuses of universities does not make clear if these institutions could serve the diverse constituencies of many community colleges. Dougherty observes that accenting the noncollegiate functions of the community college "would leave homeless the perhaps one-third of community college students who aspire to a baccalaureate degree" (p. 270). What he ignores is the converse of that statement. Stressing the transfer function of community colleges through converting them into two-year branch campuses of universities or even changing them into four-year schools may then "leave homeless" the majority of community college students who attend the institution for reasons other than attaining a bachelor's degree. While Dougherty briefly acknowledges the importance of maintaining the community colleges's comprehensiveness through keeping some vocational offerings, he suggests they be decreased from their current amount. Implicit in Dougherty's proposed structural reforms seems to be the attitude that many people who are currently attending community colleges should not be attending, or at least not for the reasons that they are.

Dougherty's structural recommendations are not groundbreaking. Almost twenty years ago Stephen Zwerling [9] urged changing two-year schools into four-year ones in his Marxist critique of the community college. Dougherty's recommendation to convert community colleges into two-year state university branch campuses is more novel in the literature, although in practice a strong system of two-year branch campuses has existed in several states, for example, Hawaii, Kentucky, Pennsylvania, for many years.

Dougherty's major contribution to the debates about the community college is his use of state relative autonomy theory to indicate how government officials have been influenced to support the community college. Dougherty contributes substantially by showing how both the advocates and the critics of the community college have been myopic in their ignoring or minimizing of the role of government officials. Also, by using five states as examples to illustrate the theory, Dougherty presents a more comprehensive and convincing perspective on two-year schools nationally than have critics such as Brint and Karabel (1), who used evidence primarily from one state, Massachusetts, in their institutionalist critique of the institution.

It remains for the "definitive" work on the community college to be written, one that acknowledges and validates the needs of all its constituencies, including its faculty and nontransfer students. In the meantime, *The Contradictory College* is the best book thus far about that complex and influential institution, the community college. Anyone — administrators, faculty, graduate students — who wants to know about the community college must read this book.

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Book Reviews

The Law of Higher Education: A Comprehensive Guide to Legal Implications of Administrative Decision Making,
Third Edition, by William A. Kaplin and Barbara A. Lee.
San Francisco: Jossey-Bass, 1995. 1023 pp. $75.00

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It is rare, in fact, virtually without precedent that the third edition of any work would be a noteworthy event, much less an occasion requiring review. However, law professor William Kaplin's third edition of *The Law of Higher Education,* while built upon his 1978 [1] and 1985 [3] volumes, is like a glittering new addition built onto an old house — one where the old house seems to disappear into the new structure and where the new addition shores up and transcends the features from the old house. Once comfortable, the old house is outgrown, and the transformation confirmed by the spacious new addition. This is the perfect metaphor for the Kaplin text, which grew from its original 500 pages (plus an ill-advised 184-page supplement a year later [2]) to its former 621 pages to this mammoth 1023 pages. In a word, it has doubled in seventeen years. Even this growth rate fits, as higher education case law and regulation have surely doubled in that period of time.

Nothing better exemplifies the growth and change in higher education law during that period than do the new categories and major revisions he adds to the earlier categories. By my rough count, he has added thirty one new categories, ranging from sexual orientation litigation to campus security, to hate speech and state regulation of NCAA enforcement activities. In each of these crucial areas, there have been recent cases involving higher education or legislation aimed at a higher education issue. He also added an entirely new chapter, on business and industrial issues on campus, particularly intellectual property rights. Moreover, his previous sections are often unrecognizable, with roughly 41 having been extensively revised or expanded beyond the original treatment. In truth, virtually none of his hundreds of sections was untouched by legislative, regulatory, or litigative change in the intervening decade.

If the subject matter quickened its pace and mutated beyond all recognition, Kaplin's sure touch remains substantially in evidence. In this *Journal,* in 1987, I praised his second edition in words that are still useful and accurate to describe this newest effort: "Kaplin's work stands out because it represents an extraordinary undertaking of sheer hard work, enormous synthetic power, and an obvious love of his subject matter. No one of these traits above suffices, and we are all grateful to Kaplin for this important labor" [6]. Of course, one's admiration grows each time this Olympian task is undertaken, as should the gratitude of the many users.

For this new edition, Kaplin has taken on Barbara A. Lee, no stranger to *JHE* readers, as a collaborator. Lee, a human resource management professor and higher education law scholar (she coauthored the estimable 1987 book, *Academics in Court* [5]) has left her mark, especially in the beefed-up treatment of affirmative action, nondiscrimination, and personnel issues. Not only will she lend her expertise to the treatise, but having a coauthor should keep Kaplin on track for subsequent editions. A decade between editions is an unsatisfactory state of affairs. A note on revisions planned for the third edition: the National Association of College and University Attorneys (NACUA) has announced its intention to issue an annual "update," presumably supplementing the text with each year's new cases, statutes, and other materials. (They are also making available an instructional manual; when it rains, it pours.)

In this area, I urge the authors not to repeat the error of their format for the 1990 "update" they fashioned to supplement the 1985 second edition. The first half of the *1985-1990 Update* [4] was useful, keyed as it was to the earlier volume, and chockfull of cases, articles, and statutes. The commentary was crisp and concise. However, Part 2 was, in my view, a failure. It bifurcated the treatment of cases and confusingly split the *Update* into two unequal halves, the second half elaborating upon Fernand Dutile's annual *Journal of College and University Law* survey of higher education cases. Thus, persons wanting information on faculty union dues litigation would look up the *Lehnert* case at section 3.2.2 (organization, recognition, and certification), both at p. 48 in Part 1 and again at 3.2.2 in Part 2, pp. 271-272. Neither of the two parts had an index, an indispensable finding tool for a useful treatise. I urge them to employ more traditional, straightforward legal text supplement style and to provide a detailed and cross-referenced index in each of their supplements. I also hope the supplements will be cumulative, to avoid having to cross-check so many volumes.

But I quibble. This new edition is most welcome and should be within arm's length of all higher education scholars, administrators, and counsel. Its summaries of trends and cases are clear and fair; its suggested readings are well annotated and useful; and its scope and coverage are almost universal. It truly covers the universe, and in sufficient detail to give the reader the quintessence of the issue. I will stand by my earlier appraisal, as it fits here as well: "As with our favorite novelists, they never seem to produce their next work soon enough. I, for one, anxiously await Kaplin's next masterpiece." Well, I am pleased to announce that it is here, in fine bookstores everywhere.

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William Zumeta

Meeting the Demand for Higher Education Without Breaking the Bank

A Framework for the Design of State Higher Education Policies for an Era of Increasing Demand

Introduction

This article seeks to present and illuminate empirically a model of policymaking in an area of emerging, if little appreciated, importance, namely, state policies affecting private (nonprofit) higher education. Further, it shows the interesting implications of this model and the associated empirical results for policy in this area now as many states enter an era of sharply increased demand for higher education but limited resources to pay for new capacity [65, 67].

The basic idea is that state *policy postures* toward private higher education can tend toward one of three nodes:

- *laissez-faire,* in which state policies largely ignore the private sector;
- *central planning,* in which state policies involve the private sector substantially, use private institutions to play carefully planned and enforced roles in the state system and pay for this involvement financially via such means as direct subventions to private institutions and aid to their students;

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- *market-competitive,* in which state policies also seek to take account of and utilize the private collegiate sector, but in which the state plays much less of a planning, allocative, and regulatory role than under central planning and instead employs market forces and signals (e.g., "portable" student aid grants, lower subsidies built into public institution tuitions, information policies) to guide allocation of programs, students, and resources.

The analysis matches individual states' policies empirically to these constructs (or in some cases to hybrids of them) and then considers how well each policy set fits the circumstances of the states that employ it. The key broad conclusion of the empirical analysis is that the market-competitive constellation of policies is associated with the most attractive combination of policy outcomes: high participation rates in higher education, reasonable quality in public higher education, and a healthy private sector providing choice to students, all at only average levels of taxpayer spending (per capita) on higher education and well below-average levels of taxation overall. Assuming these associations are some guide to the future, then the market-competitive states seem to be well positioned to face the emerging era of rapid growth in demand for higher education that many states will encounter without depending solely on costly expansion of public colleges and universities. This conclusion squares with the common-sense idea that it should be cheaper to meet some part of large new enrollment capacity requirements by directing some students toward private higher education (even at some financial cost to the state) than to meet all the demand by expanding space in the public sector.

The laissez-faire states, in contrast, though they also include a number of states that face rapid growth in demand for higher education, appear to be poorly positioned by virtue of their policy histories and current policies to cope with such a period of growth cost-effectively. These states have generally experienced rapid population growth in recent years but only slow growth in their private higher education enrollments (which tend to be relatively small, though in most cases not insignificant). Their spending on public higher education per student (a crude indicator of quality) and their overall participation rates in higher education tend to be near the national average, but it seems unlikely that these performances can be sustained in the face of strong demand growth, for this is both the poorest group of states and the one already making on average the highest overall "tax effort." Yet these states also spend well above average per capita on higher education. Thus, the analysis suggests that these states need to rethink their higher education policies, particularly those affecting the private sector, if they are to cope effectively in the new era of increased demands and tightly constrained state tax revenues. The analysis also points to various factors which suggest that such rethinking will not come easily, but it indicates some potentially promising directions.

The states whose policies most closely match the central-planning construct also show signs of less-than-optimal positioning to face the emerging era of substantial growth in demand for higher education, which all the states in this group face. Though they are the wealthiest group of states, these states spend the least on higher education per capita and the least per student in public institutions (suggesting low quality). These states as a group are near the national average in overall participation in higher education, partly because they are also near this benchmark in private sector share of enrollment. But, though their recent population growth has been above average, the gains in their enrollments in private institutions have been well below average (though quite variable). Thus, this group of wealthy states heavily manages its higher education system — hence the central-planning designation — but spends relatively little on it and does not have particularly impressive results to show in terms of quality, access, or private sector growth.

Results of the analysis suggest that politically feasible policy changes for the new era for these states might lie in the direction of the policies of the central-planning/market-competitive hybrid group of states, whose outcomes somewhat resemble the generally favorable results of the market-competitive group (but who differ from this group in that they score relatively low on overall participation in higher education). In general, the analysis herein gives considerable explicit attention to indications of political feasibility of possible policy changes and to specific policy levers, in part by analyzing pertinent possible determinants of the state policy postures such as states' higher education governance structures, private sector market share, and lobbying efforts of the private higher education sector.

After this introductory section I explain why the issue of state higher education policies is significant and timely. Then follows a brief background discussion on conceptualizing models of public policymaking, designed to prepare the reader for the presentation of the constructs of state policy postures vis-à-vis private higher education, which are the centerpiece of the article. Next, after a brief theoretical discussion of the reasons why state policies in this area might or might not be significantly linked to one another, I present empirical evidence demonstrating that they are indeed related in order to show that it is reasonable to look for coherent policy postures in this field. In this section I also list and briefly describe the specific policies under examination as well as the sources of data and the definitions of the variables. Then, with the stage properly set, the state policy posture constructs are explained in depth, and some expectations about their origins and implications set out.

Next, I employ cluster analysis to explore empirically the fit of the proposed constructs of state policy postures toward private higher education to the actual linkages among policies. This analysis classifies the states into several policy posture categories — the three originally proposed plus two hybrid categories created from the initial three. These five categories are conceptually coherent and plausible in addition to fitting the data rather well.[1] The next step is to associate empirically membership in each of the policy clusters with significant state characteristics, focusing most on those characteristics with implications for outcomes of broad interest to policymakers (such as overall participation rates in and level of state/local spending on higher education per capita) and on those characteristics (such as state higher education governance structure, tax effort, and private sector market share) with the most promising linkages to levers and prospects for policy change. Finally, the implications are drawn for current policy decisions and for further research on policymaking in this area. Readers less interested in the methodological details might wish to focus most on the sections describing the results of the empirical analyses of the state policies and postures and on their implications for policy.

Public Policy and Private Higher Education Today

The private higher education sector in the United States is of historic and high current importance. The contributions of the private sector to higher education date back to the colonial period and are well known [45, 51, 56] and widely envied around the world, where substantial private collegiate sectors are relatively rare [10, 19, 26].[2] There are nonprofit private colleges in the District of Columbia and in 49 of the 50 states. According to recent data, a total of nearly 1,900 such institutions enrolled some 2.95 million students in the fall of 1992 [60]. Even limiting attention to four-year, Carnegie-classified, nonspecialized colleges and universities in the fifty states (thus excluding hundreds of two-year, unclassified and specialized institutions such as seminaries and free-standing law schools), the total "headcount" enrollment in this narrowly defined private higher education sector is more than 2.4 million. Although their market share has declined sharply since World War II, private institutions still grant some 28% of all baccalaureate degrees, 36% of all PhDs and 60% of all first professional degrees, including a high percentage of teacher education degrees.[3] Thus, the private sector is of real importance to current national goals in regard to skilled labor force development.

The proportion of statewide enrollments in private nonprofit institutions is small in some states but ranges to well above 50% in Massachusetts and to almost 85% in the District of Columbia (fall 1992 figures). The overall figure for the nation is about 20%,[4] down from around 50% at the time of World War II. It is estimated that it would cost taxpayers an additional $12 billion annually (1990 dollars) to educate in the public sector all the students now attending private colleges and universities [16, p. 11].

Moreover, private colleges and universities are a very diverse lot, and their autonomy permits them to offer a range of choices to students and other clients, such as government and corporate research sponsors, that would be hard to imagine being duplicated in the public sector. In short, they permit diversity to flower, and to die if the market so dictates. Their capacity as nongovernmental institutions to respond rapidly to changing societal needs and to experiment is clearly of significant value to society [5]. In terms of their value in serving the equity-oriented ends of public policy, it is notable that private colleges and universities as a group enroll nearly as high a proportion of minority students as public institutions do [40], and they graduate a substantially higher percentage of those they enroll [43]. Also, contrary to popular belief, according to studies in several states the family income profile of private college students in the aggregate is very similar to that of students in the four-year public sector and is substantially less affluent than that of the leading public research universities [40].

Current Concerns

Thus, there is ample reason for public policy to be concerned with the capacity and vitality of private higher education, given the key societal functions it performs uniquely (or especially well) and the extent to which it eases burdens on the public treasury in many states. If the private sector continued to perform these functions in the absence of policy intervention or change, there would be no cause for concern. But I will argue, there are reasons to think that a key part of the private sector will be unable to do so. Indeed, it is already visibly slipping in its ability to serve public purposes.

In light of the limited resources pragmatically available to governments today, the point about reducing burdens on the public treasury takes on added importance. Most important, though many state policymakers are not yet fully aware of it, a majority of states will soon face increases — some very substantial increases — in the demand for places in higher education simply by virtue of known demographic trends. In particular, the maturation to college age of the large baby boom echo cohort of children born in the late 1970s and early 1980s and the effects of recent population growth patterns will be felt very strongly in many states by the year 2000. According to the Western Interstate Commission on Higher Education's latest projections (published fall 1993), the number of high-school graduates will increase between 1991-92 and 2001-02 by *forty percent or more* in six states (including populous California and Florida), by 20% to 39% in eighteen more, and by 10% or more in yet another fifteen states (see Figure 1). These figures are a good rough indicator of pressures to add enrollment capacity in higher education (hereafter termed simply demand).[5]

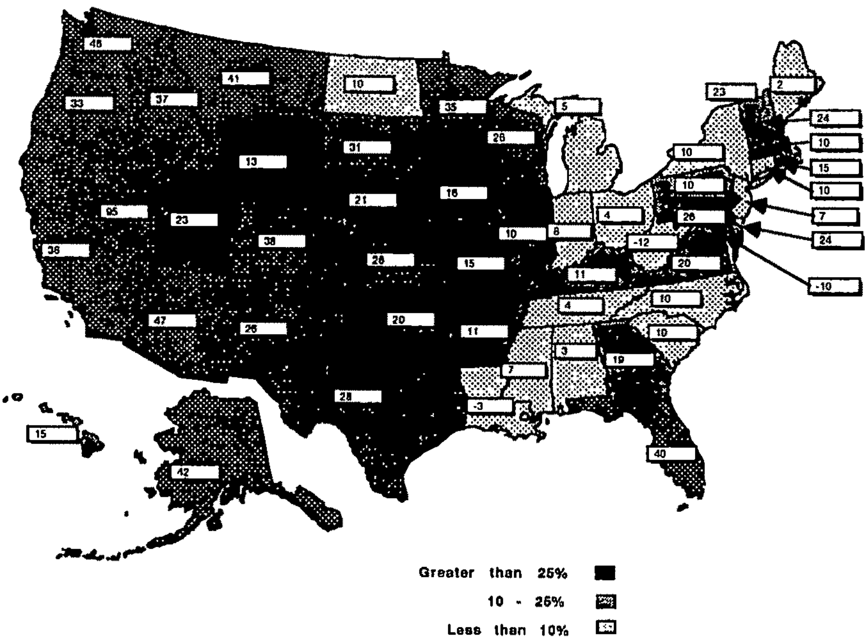

FIG. 1. Projected Percentage Change in High-School Graduates, 1991-1992 to 2001-2002

SOURCE: [58]

Additional increases in demand for higher education may well be spurred by the clear recent signs of strong labor market rewards for college graduates [37] and by the growing interest of employers and their employees in higher education as a means of increasing workers' human capital.[6] In many cases high-cost professional school enrollment slots (e.g., in engineering and some health professions) will be in particular demand. Yet, in the face of this growing demand, many public higher education systems are at or near capacity to enroll students and would have to build additional buildings or whole campuses and hire additional faculty to expand enrollments significantly,[7] short of radical reconfiguration of campus missions or delivery modes. Such expansion is likely to be a very expensive proposition on a per student basis at a time when public support for taxes and government spending is at a low ebb.

While some public sector expansion will no doubt be necessary in most states with growing enrollment demand, many of these same states have private colleges and universities with apparent slack capacity after years of relatively stable or even declining enrollments. Ten states showed a decline over the 1980-90 period in undergraduate enrollments in private, four-year colleges and universities, and another 16 states and the District of Columbia experienced only small aggregate increases (less than 10%) over this decade, suggesting that some private institutions in these states may well have slack capacity. Among the 10 states with 1980-90 enrollment declines in the private sector, 3 anticipate growth in high-school graduates over the decade 1991-92 to 2001-02 of 20% or more, and 3 more expect growth of more than 10%. Of the 16 states where private enrollments grew slowly in the 1980s, 10 expect gains of 10% or more in high-school graduates, and 4 more anticipate growth in the 10-19% range. Table 1 juxtaposes the state-by-state data on recent private higher education enrollment change against the WICHE projections of numbers of high-school graduates expected in the decade ending in 2001-02.[8]

Incremental costs to add students at institutions with excess capacity should be relatively low, certainly lower than the per student cost of building additional capacity in the public sector.[9] In addition, some private institutions wish to grow regardless of slack capacity considerations, and it may well be in the taxpayer's interest for them to do so, even if this requires some financial inducement from the state (assuming the state does not have to pay as much per student place as it would for public sector capacity). For now the primary point is that private higher education's capacity and vitality — that is, its quality and capac-

TABLE 1

Indicators of Possible Slack Capacity in Private Sector and Overall Demand for Higher Education, by State

State	Percent Change in Private UG Enrollment, 1980-90[a]	Projected Change in High School Graduates, 1991-92 2001-02[b]	State	Percent Change in Private UG Enrollment, 1980-90[a]	Projected Change in High School Graduates, 1991-92 2001-02[b]
OK	−15.6%	20%	WA	9.6%	46%
NJ	−15.2%	7%	VT	9.6%	23%
CT	−14.1%	10%	KY	10.2%	11%
WV	−13.2%	−12%	GA	10.3%	19%
ID	−11.0%	37%	MN	11.4%	35%
MA	− 8.3%	10%	UT	12.9%	23%
AL	− 3.6%	3%	LA	14.4%	− 3%
NY	− 2.4%	10%	IA	14.8%	16%
MT	− 2.0%	41%	NC	15.3%	10%
IN	− 0.1%	8%	MS	16.5%	7%
KS	0.9%	26%	SD	16.6%	31%
RI	1.2%	15%	MD	18.7%	26%
CA	2.7%	36%	OH	20.7%	4%
PA	3.1%	10%	OR	23.2%	33%
TN	3.9%	4%	DE	24.9%	24%
NM	4.9%	26%	MO	31.1%	15%
NH	5.3%	24%	SC	33.0%	10%
MI	5.8%	5%	WI	33.6%	26%
DC	5.8%	−10%	ME	44.1%	2%
AR	6.7%	11%	ND	47.5%	10%
NE	7.7%	21%	VA	50.0%	20%
TX	8.9%	28%	NV	53.9%	95%
CO	9.1%	38%	AZ	68.4%	47%
IL	9.3%	10%	HI	74.3%	15%
FL	9.5%	40%	AK	187.8%	42%

SOURCES: [a]Developed from raw data collected by U.S. Department of Education HEGIS/IPEDS surveys; [b][58].

ity to grow — is, if anything, more squarely than ever a legitimate concern of policymakers.

Threats to the Health of Private Higher Education and Implications

It can be argued that private higher education faces serious threats to its capacity to continue to serve public purposes well [16]. These threats have been brought on by the long period, dating back to around 1980 but now coming to an end, of decline in numbers of high-school graduates, by a rapid increase in the private/public sector price ratio (or "tuition gap") and by very sluggish, erratic growth in federal student aid funds [11, 12]. These trends are in all likelihood related to the declines in private sector enrollments in 10 states, which occurred in the 1980s, to the exodus of middle-income students from private institutions identified by McPherson & Shapiro and Zumeta [33, 34, 63], and to the sharply increasing trend in private institution spending on student aid to attract students [7, 12, 39]. These latter trends suggest potential problems in the ability of the private higher education sector, or at least significant parts of it, to serve public purposes (especially the enrollment of students of modest circumstances), problems that are exacerbated by public policy and which state action could help address.

On the whole though, it is not clear that private higher education has fared badly with the limited attention it has received from public policy during a period of very difficult environmental conditions. Nationwide, full-time-equivalent enrollments in private higher education grew by about 11% between 1980 and 1992, not far behind the growth rate for public sector enrollments [60]. There was some enrollment growth in the private sector in a surprising nine-tenths of the states during this period and, as was just indicated, the coming years promise substantially more favorable demographic trends in most states. In short, the evidence on private higher education's health and prospects is decidedly mixed. Thus, the argument for enhanced public policy attention to the private sector to be considered here hinges more on the idea of states seizing an opportunity to meet emerging needs cost-effectively than on any need to rescue a long-valued sector in trouble.

State Policies that Affect Private Colleges and Universities and Linkages among Them

I turn now to the major state policies that affect private colleges and universities. First I describe the policies and the available data about them. In addition to conveying a concrete sense of the state policies in this field, I provide some practical insights into the varied arrangements by which states can employ private colleges and universities to serve public purposes. Then, I will discuss whether these policies can reasonably be thought of as part of a coherent state *posture* vis-à-vis private higher education and will consider some basic empirical evidence that indicates that it is reasonable to look for patterns of related policies in this field. Next I describe and try to make clear these state policy postures and their implications.

The Major State Policies that Affect Private Colleges and Universities

A host of state policies affect private colleges and universities in some way, ranging from general state regulatory and tax policies (e.g., worker safety regulations, tax deductions for donations to nonprofit organizations) to very specifically targeted policies like state student aid programs available only to private college students or contract arrangements with private institutions to subsidize enrollment slots for state residents. Historically, empirical data on these policies have been very limited. The data utilized in the analyses to be presented in this article come from three sources. One is a national survey on state policies affecting private colleges and universities that I conducted for the Education Commission of the States Task Force on State Policy and Independent Higher Education [62], hereafter referred to as "ECS survey." Respondents were state higher education agency executives (or their delegated subordinates) and state private college and university association heads. The survey covered all the major state policies affecting private colleges and universities except student aid funding levels and state policies influencing public institution tuition. These latter topics were covered at about the same time by the other two major data sources utilized herein: a survey by the National Association of State Scholarship and Grant Programs [NASSGP][10] on state student aid funding, and one by the State Higher Education Executive Officers [47] on tuition policies.

According to those who represent these institutions in state capitals, the state policies most important to private colleges and universities as a group are in the area of student aid (state scholarships and the like) program design, and funding [62]. In response to federal funding incentives originating in the 1970s, virtually all states have state student aid programs for which needy private college and university students (mostly undergraduates) are eligible [38]. A few states provide "tuition equalization" grants to students who attend private institutions regardless of the student's need status. But the level of funding for state awards and such design features as tuition sensitivity, the maximum award allowed, and the maximum family income level permitted for eligibility for need-based grants vary widely across the states. Tables 2 and 3 show the great range in state funding levels for student aid and, in particular Table 3, for aid that reaches private sector students.[11]

Nearly all the state student aid programs help private institutions *indirectly* by providing aid to their students or potential students rather than providing funds directly to the private school. Such funding might be regarded as the purchase by the state of student enrollment slots at nonpublic institutions according to eligible students choice of institutions rather than as aid to these institutions, although it clearly has both effects and probably in most cases both purposes. States can also contract *directly* with private colleges and universities to enroll students in particular fields where the alternative would be to build addi-

TABLE 2

States Ranked by 1988-89 Estimated State Grant Dollars per Fall 1986 Undergraduate Full-Time-Equivalent Enrollment

State	Undergraduate State Grant Aid per Undergraduate FTE Enrollment
1. New York	$492
2. Iowa	396
3. New Jersey	338
4. Vermont	335
5. Minnesota	326
6. Pennsylvania	271
7. Illinois	270
8. Massachusetts	260
9. Connecticut	242
10. Indiana	242
11. North Carolina	174
12. South Carolina	173
Nation	172
13. Ohio	161
14. West Virginia	158
15. Texas	156
16. Michigan	155
17. Rhode Island	152
18. Wisconsin	151
19. Georgia	128
20. Oklahoma	116
21. Florida	114
22. New Mexico	114
23. Colorado	111
24. Kentucky	106
25. Oregon	95
26. California	92
27. Utah	91
28. Virginia	85
29. Maryland	84
30. Tennessee	82
31. Missouri	70
32. Arkansas	67
33. Louisiana	63
34. Washington	61
35. Alabama	57
36. Kansas	49
37. Delaware	41
38. Maine	33
39. North Dakota	33
40. District of Columbia	23
41. South Dakota	22
42. Nebraska	21
43. New Hampshire	21
44. Mississippi	18
45. Arizona	17
46. Hawaii	13
47. Montana	13
48. Idaho	12
49. Wyoming	11
50. Alaska	9
51. Nevada	8

SOURCE: [38 (1988)].

tional public sector capacity. In addition, states may contract with private institutions for other services, such as research or technology development in particular fields, enhancement of programs to aid disadvantaged students, or sharing the cost of building a library or other facility for joint public/private use. In all, in 1988, 21 of the 50 states provided funds to private colleges and universities, whether by contract or other means, for purposes *other than* student aid or the occasional research contract [62].[12] Table 4 provides survey results on the distribution and nature of these types of programs.

The survey data suggest both diversity in states' priorities and needs as these intersect with the capabilities of private colleges and universities and also considerable variety in legal and fiscal arrangements for

TABLE 3

Rankings of States by 1988-1989 Estimated Expenditures on Comprehensive Need-Based Undergraduate Student Aid to Private Sector Students per Private Sector FTE Enrollment

State		State Private FTE Enrollment (Fall 1986)	Estimated Payout to Private Sector Students ($thousand)	Estimated Private Sector Payout Amounts per FTE Private Student (dollars)	Students at Private Voc/Tech or Nursing Schools Eligible for Any State Aid?	Significant[c] Non-Need Based Programs in Existence?
1	Michigan	58,268	$ 51954	$891.57	Yes[a]	No
2	Iowa	38,762	29221	753.83	Yes[a]	Yes
3	S. Carolina	23,660	17828	753.59	No	No
4	Illinois	127,832	86982	680.42	Yes[a]	No
5	New York	351,897	228314	648.80	Yes	No
6	Minnesota	42,585	27280	640.60	Yes	No
7	New Jersey	44,922	26877	558.37	Yes	No
8	Indiana	49,433	25228	514.43	Yes[a]	No
9	California	168,219	81597	485.08	Yes	No
10	Wisconsin	31,763	14508	456.82	Yes	No
11	Kansas	11,429	4832	419.98	Yes	No
Nation		2,283,978	819354	358.74	—	—
12	Pennsylvania	196,368	64843	330.20	Yes	No
13	Connecticut	44,964	14146	314.17	Yes	Yes
14	Kentucky	25,084	7975	310.96	Yes[b]	No
15	Vermont	11,776	3390	287.87	Yes	No
16	Ohio	103,244	26214	253.86	Yes	Yes
17	Texas	78,527	19350	246.41	No	Yes[d]
18	Maryland	24,911	4802	192.69	Yes	Yes
19	W. Virginia	8,002	1401	174.96	Yes	Yes[d]
20	Massachusetts	194,890	33719	173.02	Yes	Yes
21	New Mexico	1,174	1806	154.17	No	Yes
22	Missouri	58,101	8678	149.40	Yes[a]	Yes
23	Tennessee	43,210	6412	148.35	Yes	No
24	Alaska	833	12	120.05	Yes	No
25	Florida	80,057	9536	119.17	Yes	Yes[d]
26	Oregon	16,280	1878	115.48	Yes	No
27	N. Dakota	2,071	166	82.09	Yes[a]	No
28	Oklahoma	17,909	1273	70.91	Yes	Yes
29	Arkansas	9,579	645	67.57	Yes[b]	No
30	Washington	25,091	1548	61.78	Yes[b]	No
31	Mississippi	8,995	561	62.37	Yes	Yes
32	Rhode Island	28,940	1973	60.72	Yes	No
33	S. Dakota	5,635	268	47.91	Yes	No
34	Colorado	16,083	703	43.52	Yes[b]	Yes
35	Alabama	18,954	814	42.74	Yes	Yes[d]
36	Georgia	41,756	1456	39.65	Yes[a]	Yes[d]
37	Virginia	37,558	1375	36.74	Yes	Yes[d]
38	Maine	10,055	331	32.82	Yes	No
39	Delaware	3,241	98	30.85	Yes	Yes
40	Nebraska	13,163	394	29.63	Yes[b]	No
41	Arizona	12,338	358	29.18	Yes[b]	No

TABLE 3 (*Continued*)

State		State Private FTE Enrollment (Fall 1986)	Estimated Payout to Private Sector Students ($thousand)	Estimated Private Sector Payout Amounts per FTE Private Student (dollars)	Students at Private Voc/Tech or Nursing Schools Eligible for Any State Aid?	Significant[c] Non-Need Based Programs in Existence?
42	N. Carolina	55,123	155	28.12	Yes	Yes[d]
43	Hawaii	7,146	1798	21.90	No	No
44	D.C.	51,999	538	13.85	Yes	No
45	Montana	3,027	25	9.91	No	No
46	New Hampshire	20,321	161	7.87	Yes	No
47	Idaho	8,553	31	3.51	Yes[b]	Yes
48	Louisiana	21,901	47	2.28	Yes	Yes[d]
49	Utah	27,446	32	1.09	No	Yes[d]
50	Nevada (1987–88)	281	0	0	Yes[b]	No
51	Wyoming	622	0	0	No	No

SOURCES: [38 (1988), 53].
NOTE: Private sector state higher education enrollment includes data on degree-granting proprietary institutions. In addition, payout dollars to private institutions includes dollars to vocational/technical and nursing schools in some states (see column 4).
[a] Nursing schools only.
[b] Voc-tech schools only.
[c] >20% of total estimated state grant aid in 1988–89 for other than need-based programs = yes.
[d] Non-need based aid plus other aid greater than need-based aid in 1988–89.

providing state support. The most common arrangements governing the state subventions were formulas linking state dollars to enrollment slots or degrees awarded (27 of 53 programs that provided the relevant data reported such *capitation* formulas) and *contracts* between the state and recipient institutions (also 27 of 53 programs providing these data). Many of the contracts were for something other than enrollments or degrees, however, such as support for a specific capital project or start-up help for a new program. Ten programs provided state support for a wide range of purposes without benefit of any contract or capitation formula. Many of these operated on a grantlike basis: the state agency solicited proposals and funded the ones it found best suited state needs, often with quite broad guidelines as to what types of projects might be eligible. A number of states had more than one program encompassing two or more of the above types of arrangements, suggesting that states have a variety of instruments at their disposal in this policy arena to meet various objectives and state policymaker preferences.

The survey also revealed, somewhat surprisingly, that a substantial share of the state programs that provide funds directly to private colleges and universities were not limited to funding these institutions. In

TABLE 4

Type of Programs of Direct State Payments to Independent Institutions and Their Frequency

Type of Program	No. of Such Programs		No. of States w/ Such Programs
General institutional support	6	6:	IL, MD, MI, NJ, NY, PA
Support for health sciences & health professional programs (most common fields are medicine, dentistry and nursing)	22[a]	14:	AL, FL, IL, MA, MI, NC, NH, NJ, NY, OH, PA, TN, TX, WI
Support for ed. programs in other specific fields (most common fields are education and engineering)	12[b]	12:	AL, FL, IL, MD, MO, NC, OH, PA, RI, SC, TN, VA[c]
Research/technology support	10	7:	FL, GA, LA[d], NJ, NY, OH, TX
Program support for programs serving disadvantaged students	6	6:	LA, FL, MA, MI, NJ, NY
Support for cooperative ventures (excludes technology ventures included above)	4	4:	AL, IL, MA[e], RI[e]
Broad-purpose capital assistance	3	3:	IL, MD, PA[d]
Support for endowed chairs only	2	2:	NJ, NY
Support for instructional quality improvement only	2	2:	LA[c], SC[d]
Unclassifiable (has supported very diverse activities)	1	1:	NJ, (Dept. of Higher Education special-purpose grants)

SOURCE: [66].

[a] Includes cases where support for health fields is part of a larger program also supporting other fields.

[b] Includes cases of state appropriations to specialized institutions.

[c] First funding in 1988-89.

[d] Not funded in 1987-88.

[e] Higher education/K-12 cooperation.

nearly half the cases for which the relevant data were available from the survey (26 of 55, or 47%), private institutions received funds from state programs under which public institutions were also eligible. Moreover, even in the programs applicable only to private colleges and universities, which mostly involve purchase or subsidy of enrollment slots (often in high-cost professional fields), these institutions are implicitly competing with public sector alternatives for the use of these funds in that the state university system could open or expand a program in the field instead. These data are at variance with the widely assumed view that programs providing state funds to private colleges are essentially "institutional aid." Rather, in many cases the private schools appear to be seen as alternative suppliers of services in a competitive marketplace, with decisions about whom to fund presumably made in substantial measure on the basis of judgments about comparative cost-effectiveness.[13] The distinction is an important one in understanding these state policies.

There are other state policies of particular importance to private higher education. State mandates in areas such as teacher education or data collection (e.g., student outcome data) can have profound implications for private colleges and universities. Also, states may provide by law or practice for private sector representation on the state higher education board itself, for participation in its formal planning activities for higher education (e.g., for new campuses or new telecommunications capabilities), or in state review/approval of new academic programs proposed by public institutions. There are often high stakes in these planning and "program review" decisions for the long-term strategic position of private institutions, yet the survey data show a very mixed picture in terms of private sector participation in them [64].

Another set of state, or at least heavily state-influenced, policy decisions that are of great importance to private colleges and universities are decisions about tuition levels in public higher education.[14] Yet, a survey of state higher education agency heads showed that impacts on private institutions get little or no consideration in these decisions in all but a very few states [47].[15] So, states seem to use the powerful policy instrument of pricing of public higher education services in a way that virtually guarantees unintended effects.

In sum, state higher education policymakers can be more or less conscious or strategic in their use of the various types of policy instruments at their disposal — some of which have much broader reach than the private higher education sector alone — heeding or not their impacts on private colleges and universities as well as on the state's full range of needs and objectives in higher education. The point here is simply that the impacts on private institutions, which affect the ultimate achievement of reasonable state goals in higher education, often seem to get short shrift in the weighing of these tradeoffs. Having now provided a sense of the nature of the data with which we are working, I turn to the empirical analysis to look for evidence of comprehensible coherence in the range of state policies affecting private higher education using the state as the central focus of analysis. This analysis aims also to make clear the state characteristics associated with particular types of policies and will help us to understand whether and how changes might be effected.

Specific Policies to be Examined in the Empirical Analyses

The empirical analyses to be presented next utilize data on the following state policies (or in the case of some analyses a subset of these), selected for their importance and contribution to providing a complete picture of state policies affecting private higher education. This objective is constrained somewhat by data availability. The policies to be examined here, their measurement, and the sources of data used are listed below.

1. *State student aid funding level (or effort)* — This variable is estimated state grant aid dollars to undergraduates in 1987-88 divided by statewide FTE undergraduate enrollment in fall 1985 as reported by the NASSGP (1988) survey [38]. These data are shown in Table 2.[16]
2. *Absence/presence of direct state payments to private institutions* — This is a dichotomous variable drawn from the 1988 survey by the author (here "ECS survey"). Both direct state appropriations to and contracts for services with private institutions are included except cases of small, one-time research project grants and funds that must be used by the school for student aid (to avoid double-counting funding for student aid). See Table 4 for the range of programs covered.
3. *Public higher education tuition levels*[17] — This is a three-category variable (low, moderate, high) developed by Curry [13] from data collected by the Washington Higher Education Coordinating Board for the 1987-88 academic year. The states are nearly equally divided among the categories, with 17 states each in the high and moderate categories and 16 in the low-tuition category.
4. *Extent of private sector involvement in state higher education planning* — This variable is drawn from the responses of the state higher education agency officials to a question on the ECS survey. Responses were scored on a four-point scale ranging from no involvement to extensive involvement.
5. *Absence/presence of duplication of private institution programs as a criterion in state review of public institutions' new program proposals* — This variable is also drawn from state higher education agency responses to the ECS survey.
6. *Extent of state mandates and regulation affecting private colleges and universities* — This is a four-category variable, ranging from none to extensive mandates/regulation, based on responses of both higher education agency and private college association heads to several pertinent questions posed on the ECS survey.

Exploring Linkages among State Policies Affecting Private Higher Education

Although state policies that affect private higher education are disparate, there are reasons to believe that within individual states such policies might be related to each other in a more or less coherent fashion. First, rational policymakers seeking maximum impact and minimum unintended consequences from the set of policies in place at any given time would be expected to try to select policies that meshed well with others in the same bailiwick, whether policies already in place or ones simultaneously enacted [44]. Second, although the policies in place at any time have typically evolved over a considerable period, they emerge from policymaking systems and cultures that are fairly stable over time.[18] Yet for all its apparent logic, policy coherence is hardly inevitable. Public policymaking processes certainly do not always produce evidently rational results [27], especially when a set of policies enacted over a long period is viewed at a single point in time. Also, because many state policies affect private higher education only secondarily in the course of pursuing other, more primary goals, the cumulative array of policies touching this sector could be virtually random.

Howlett [20] describes a school of thought on the study of policy instruments (the continuum school), with its roots in such classics as Dahl and Lindblom [14] and Kirschen et al. [23]. This school argues that conceptions of policy tools, and by extension regimes such as those introduced earlier and described in more detail below, are most useful in understanding instrument choice. The argument is that for most tasks a number of policy tools are available, but that policymaker choices among them are driven more by the political, social, economic, and ideological variables at work than by rational assessment of which tool is right for which job. Such analysts as Linder and Peters [28] in the contemporary "policy design" school, seek to blend the earlier ideas of scholars who emphasized a resource-based notion of policy instruments (i.e., distinguishing direct from indirect grants, information-based strategies from coercive regulations, and the like) with those of the continuum school. Howlett concludes a discussion of these efforts by noting: The basic assumption made by design theorists is that policy instruments are technically substitutable but context-ridden. . . . For the design theorists, then, instrument choice is ultimately a political decision heavily influenced by the nature of beliefs, attitudes and perceptions held by political and bureaucratic decisionmakers [20, p. 8].

This line of argument suggests that there is indeed some logic in searching for regularities among a state's policies in a particular field, such as those affecting private higher education. I begin the task by looking briefly at the bivariate correlations among the key policies of states that affect private colleges and universities. If states' policies in this sphere are largely unrelated, there is no point in seeking understandable state "policy postures." In fact, I will show that state policies affecting private higher education are systematically intercorrelated.[19]

The level of public higher education tuition in a state (low, medium, high) is positively correlated with state "student aid effort" (state spending on student aid grants per student), as would be expected if state policies affecting the private sector are associated.[20] As Tables 5 and 6 suggest, the level of public tuition also seems to be related to the presence of contract or other direct funding of private institutions by the state and to the extent of private sector involvement in state higher education planning.[21] In addition, public tuition level is clearly related to the extent that state regulation and mandates affect the private sector; the higher public tuition states tend to report more extensive mandates that affect the private sector (chi-square significant at the 0.05 level). Thus, it seems clear that the level of public sector tuition, a key state policy affecting private higher education, is linked in some (as yet unspecified) way to other state policies affecting this sector.[22]

TABLE 5

State's Public Higher Education Tuition Level by Presence/Absence of Program(s) that Provide State Funds Directly to Independent Institutions

($N = 50$ states)[a]	Presence/Absence of State Programs Involving Direct Payments to Independent Institutions		
State's Public Higher Education Tuition Level[b]	States with Direct Payments freq/%	States without Direct Payments freq/%	Total freq/%
High tuition state	11/64.7	6/35.3	17/100
Modern tuition state	7/41.2	10/58.8	17/100
Low tuition state	3/18.8	13/81.3	16/100
Total	21	29	50

SOURCES: [13, 66].
[a] No data available for District of Columbia on public tuition level.
[b] As determined by [13].

TABLE 6

State's Public Higher Education Tuition Level by Extent of Independent Sector Involvement in State Higher Education Planning

($N = 46$ states)	Independent Sector Involvement in State Planning				
State's Public Higher Education Tuition Level[b]	Extensively Involved freq/%	Somewhat Involved freq/%	Occasionally Involved[a] freq/%	Not Involved freq/%	Total freq/%
High	6/37.5	5/31.3	5/31.3	0/ 0.0	16/100
Moderate	1/ 6.3	5/31.3	9/56.3	1/ 6.3	16/100
Low	1/ 7.1	3/21.4	8/57.1	2/14.3	14/100
Total	8	13	22	3	46/100

SOURCES: [13, 66].
[a] Includes "Occasionally involved" and "Occasionally involved but to a substantial degree on those occasions" responses.
[b] As determined by [13].

We have just seen that state student aid spending is correlated with states' public sector tuition levels. State student aid spending is also significantly higher in the 21 states with contract or other programs that provide state funds directly to private colleges and universities than it is in the states without such programs ($r = 0.35, p < 0.05$). Mean student aid spending was $176 per student in the former states, compared to $92 in the latter. State student aid spending is also associated with the extent of private sector involvement in state higher education planning ($r = 0.31$, $p < 0.05$), although this planning is rarely about student aid issues. Mean student aid spending declines in perfect progression from $191 per student in the states where extensive private sector involvement in planning was reported to $28 per student in states where no involvement was reported. Also, state student aid spending is rather strongly correlated to the extent-of-state-mandates-and-regulation scale, at $r = 0.55$ ($p < 0.001$), and weakly correlated to the use of private sector duplication as a criterion in state reviews of new public college programs ($r = 0.29, p < 0.10$).

The presence in a state of contract or other programs that provide state funds directly to private colleges was shown above to be associated with both higher public sector tuition and higher state spending on student aid. The presence of such programs is also strongly related to the extent that state mandates and regulation affect the private sector (X^2 significant at the 0.0001 level).[23]

To complete the picture, extent of private sector involvement in planning was also significantly associated with the extent that state mandates and regulation affected the private sector (X^2 significant at the 0.01 level), and was positively but not significantly related to inclusion of the private-sector-duplication criterion in state program reviews. Use of the duplication criterion in program reviews was positively though not significantly related to the extent of regulation affecting private higher education.

Plainly, this pattern of bivariate relationships suggests that it is reasonable to think of state policies affecting private higher education as linked. Next, I will elaborate the framework advanced earlier for thinking more conceptually about *how* these policies are linked and what difference this might make. An empirical effort to validate these *state policy posture* concepts then follows.

State Policy Postures vis-à-vis Private Higher Education

Given reason to believe that state policies that affect private higher education are not random or unrelated to one another, it is logical to try to identify a priori conceptually plausible configurations of state policies that affect private higher education and then to investigate empirically the presence or absence of policy combinations that resemble these configurations in the actual policies of states. It seems reasonable to theorize that states might take one of three broad types of approaches to private colleges and universities in their higher education policymaking. These are the three described briefly above, which I term *laissez-faire, central-planning,* and *market-competitive* state policy orientations or "postures" toward the private sector.[24] Without some such framework concepts it is difficult to think systematically about the wide range of state policies that affect private higher education, much less to know where or how to intervene in a state's policy "system" to affect policy outcomes or how to assess the feasibility of interventions that might be proposed. Thus, if it can be empirically validated, such a framework has potentially both positive and normative uses — it should help illuminate both policy *science* in this field and policy *analysis.*

The Laissez-faire Posture

A state taking the *laissez-faire* posture toward the private higher education sector is essentially choosing to leave this sector to its own devices. At the extreme this would mean little or no state funds for student aid would be available to private college students; no tax incentives aiding private institutions would exist beyond those available to all nonprofits; little or no consideration would be given to independent campuses' concerns in establishing public college tuition and fee structures or their mission and program configurations; no funds would be provided by the state, either by direct appropriation or by contract, to private institutions for any purpose beyond perhaps the occasional ad hoc research contract; the private sector would be excluded from a meaningful role in statewide higher education planning; minimal information about independent institutions beyond that collected by the federal government would be collected by the state; and the state's regulation of private higher education would be of the most limited conceivable scope, probably limited to licensing institutions to operate and enforcing on them general state laws not specifically targeted at higher education.

In general, it seems likely that a near-laissez-faire posture would be most plausible in states with a relatively small (in terms of enrollment share) and politically weak private higher education sector. Regional patterns should be prominent here because of historical factors that lead to slower and more limited development of private higher education west of the Mississippi [51]. Additional variables at work might include the wealth and general spending propensities of the state, because proposed aid to private colleges might look to skeptical legislators much like any other new area of state spending.[25] Also, a state's governance structure for higher education might play a role, because those states where the state policy agency is also the governing board for the public institutions — an arrangement that obtains more or less in a number of states — might be expected to be little concerned with the private sector. On the other hand, other state governance arrangements, such as one of the coordinating board types where the state agency has a meaningful policy and planning role for both sectors but no line management authority over the public institutions, should be more sensitive to the private sector's role and to potential impacts of policies on it.

What are the likely consequences of a state's pursuing laissez-faire policies vis-à-vis its private higher education sector? As suggested earlier, current competitive conditions facing private institutions, particularly those lacking large pools of surplus applicants and substantial endowments (i.e., the great majority of private colleges), imply various untoward consequences from the standpoint of the public interest, such as erosion of quality as funds are increasingly shifted from instruction and plant and equipment to student aid to compete for students; reduced ability to recruit and retain certain target groups such as minority and modest-income students; further increases in student debt loads; perhaps further moves toward more narrow, vocationally oriented curricula [6]; and, eventually, loss of capacity to enroll students and provide diversity to a state's institutional mix. If a particular state's private higher education sector is small and weak both academically and politically, the consequences may not be serious, practically speaking. In these circumstances, disruptive conflict may be avoided and little quality enrollment capacity or meaningful diversity lost if some private institutions fail to survive the current competitive era without state help.

If, however, a state's independent sector does represent a substantial resource in terms of such publicly useful values as enrollment and research capacity, quality, meaningful diversity and choice for students and other clients, and successful service to underserved areas and populations, then there is reason for public policy to be concerned about the implications of the laissez-faire posture. These implications should be of concern to policymakers, particularly in states that will soon need all the higher education capacity they can find (recall Figure 1.)

State Central-Planning Posture

At the opposite end of the conceptual continuum from the laissez-faire posture stands the state *central-planning* posture. In this policy posture, instead of ignoring the private sector as in the laissez-faire regime, the state embraces this sector as an integral part of its higher education capacity. This model can only be fully developed in a state that practices strong central planning for its public higher education sector, which usually entails a well-developed "master plan" delineating institutional roles as well as extensive mandates, planning mechanisms, data collection, and use of funding leverage to enforce the grand scheme. In such a regime the private institutions are incorporated integrally in the extensive state planning and management of higher education, get their share of attention when new state initiatives that affect higher education are planned, and, of course, would be expected to receive a substantial share of the state's higher education dollars. Indeed the money presumably helps entice them into and cement them within the state's policy system. To better ensure adherence to its plans and designs, we would expect such a state to channel some of its dollars directly to independent institutions, indeed perhaps to prefer direct funding of them at the margin to student aid and tax incentives as more effective levers to simultaneously aid and direct the private higher education sector to serve state purposes.

Central planning also implies as a basic tenet efforts by the planners to limit apparent duplication in institutional missions and programs, because such duplication seems unnecessarily expensive.[26] Such efforts become very significant to the independent sector if taken seriously, because they mean that duplication of private institution missions, programs, or geographic turf become legitimate considerations in state decisions about expansion in public higher education. This addresses one of the private sector's chief state policy concerns in the current competitive era, and therefore this sector can be expected to support actively such vigilance by state authorities. Similarly, when developing state policies that affect (or determine) public higher education tuition levels, the central-planning-oriented state would be expected to give attention to impacts of such policies on the private sector because it is dependent on these institutions to play specific roles in the state's higher education "system." Thus, public tuition levels will tend to be pushed upward, but this effect may be moderated by other factors, such as the relative political influence of the public and private sectors of higher education.

The price of solicitude from the state in program review matters, and of participation in its planning councils and funding largesse, seems likely to be increased state concern over time with private institutions missions, program configurations, and (broadly defined) performance with state funds. Thus, the state practicing extensive central planning would be expected to collect increasing amounts of data from and about private institutions (as it would about its public institutions) and to oversee their financial operations and their efforts at new program initiatives more closely over time. It would also be likely to come to see these institutions as legitimately subject to state regulation (e.g., with regard to student and institutional assessment, program review, perhaps tuition pricing), as well as to its fiscal largesse.

In short, "independent" institutions which choose to play in the state's game under a central-planning regime run the risk of becoming quasi-public. The negative side of this is that such quasi-public institutions, substantially dependent upon state dollars and subject to various formal and informal state controls, are likely to become less capable of sustaining the diversity of mission and approach, the flexibility and rapid market responsiveness, and the autonomy from a single central vision that is an important part of the reason public policy might seek to preserve an independent higher education sector [5, 48]. Also, such a centrally focused policy regime will tend to attract some of the private institutions' creative energies toward influencing the state authorities who control the resources and protections they seek, perhaps at the expense of direct attention to state service needs as reflected in student and market demands.

However, the state central-planning posture has some notable advantages as well. It permits the state to aid the independent sector largely as it sees fit in a time when many private institutions may need such aid to continue serving public purposes well. This direct institutional aid, more than "portable" aid carried through students to private institutions, can be used to target state resources to particular purposes. Second, such a regime legitimizes use of private institutions to serve public purposes in situations where they may be more cost-effective tools for the particular task than public institutions (e.g., programs serving particular regions or high-cost specialty fields where the private sector already has capacity) or where the two sectors can work cooperatively. Third, it legitimizes data gathering on private institutions and their capabilities that should have many uses in managing an integrated state higher education system for optimal results. Fourth, it permits the state authorities to shield private institutions from subsidized public sector competition if they choose to do so. Finally, extending the state's regulatory net to include the private sector may have benefits to the extent that these efforts succeed in enhancing educational quality, teacher preparedness, and the like, as they seek to do.

States tending in the direction of the central-planning model are almost certain to have historical, cultural, and legal traditions that permit and encourage both strong central planning and close state-private-sector relations. The private sector, of course, has to be both willing to participate and large enough to be worth taking into account.[27] Empirically, one would tend to look for central-planning-oriented states with heavy independent sector involvement in policymaking among states with large, politically influential private higher education sectors. These considerations point toward the Northeast and upper Midwest states with large, long-established private sectors and traditions of governmental activism strongly influenced by the affected interests. Other likely factors are a coordinating board type of state governance structure, which facilitates private sector involvement more than a statewide "board of regents" arrangement, and sufficient state wealth to make substantial student aid and programs that channel state funds directly to private institutions seem affordable.

The Market-Competitive State Policy Posture

A third, distinctly different, type of state policy posture is possible.[28] In the market-competitive regime, rather than letting the chips fall where they may as in the laissez-faire model, the states take a more active posture toward private higher education and private/public sector relations. Although these states avoid the detailed central-planning characteristic of the approach just described, state authorities under the market-competitive regime nonetheless take a comprehensive view of the state's higher education resources, including its private institutions, but seek primarily to facilitate the workings of the marketplace and to promote evenhanded competition across sectors.

Under the pure market-competitive approach, state intervention would be limited to addressing the various market imperfections (e.g., widely varying tuition subsidies not systematically related to policy objectives, the existence of near-monopolies in some markets, inadequate or no response to particular state needs by the higher education system, inadequate consumer information) that characterize the higher education marketplace. Thus state mandates and regulation would be limited. State interventions in this model would likely include tuition and competitive student aid policies designed more nearly to equalize net prices (i.e., after student aid) between private and public institutions; encourage, or at least not discourage, public/private competition not judged to denigrate quality or involve fraudulent claims; and to make efforts to disseminate widely and facilitate the use by students and their parents of comparative information about institutions' characteristics and performance [8]. This last strategy is in contrast to the central-planning regime where information policy focuses on collecting data for managing the system from the center.

Whenever the state authorities saw a particular need not being adequately addressed by the public and private institutions (e.g., inadequate production of certain types of trained specialists, a need for new economic development initiatives), the true competitive regime would describe the type of program sought and offer it up for "bids" in a competition open to competent institutions from both sectors.[29] Winning bidders would be granted time-limited, performance-based contracts subject to nonrenewal and rebidding, rather than essentially permanent institutional grant programs.[30] Such contracts would be the extent of direct institutional aid to private institutions in the true market-competitive regime, because the state would prefer aid mechanisms where the market chooses who gets how much aid, such as tax incentives for donations to institutions of either sector and aid routed through students who can choose which college to attend.

Beyond the specific and carefully targeted interventions to "perfect" the market described above, the pure market-competitive state would, in sharp contrast to the central-planning regime, allow both public and private institutions (a) to plan and modify their own offerings within existing resources without close state regulatory oversight, and (b) to compete directly for students and the resources tied to them. An empirically plausible version of this model would almost certainly, however, entail some restrictions on the program configurations of public institutions (i.e., mission limitations and some state review of new program proposals) and some basic funding guarantees to public institutions independent of enrollments.

One might summarize the differences between the state central-planning model and the market-competitive posture by observing that in the former the private institutions are treated by the state much like the public, whereas in the latter the public institutions face an environment deliberately designed to be much like that now faced by the private schools. The basic point of the latter type of state policy regime is to focus institutions more on reacting to (or anticipating) societal needs and demands by encouraging them to respond to market or quasi-market signals (i.e., enrollment-driven funding and performance-contracting arrangements) and less on working state officials for favored treatment in centrally controlled decisions on missions, programs, and resource allocations.

This model has theoretical appeal, but the full-blown market-competitive model has a number of theoretical and practical difficulties. Two problems are paramount. First, the large costs involved in reducing the effective price gap (tuition gap net of financial aid) between private and public institutions necessary to reduce the privates sensitivity to direct public sector competition may be seen as prohibitive in many states, though such expenditures could actually serve to offset public institutions' demands for funds to serve more students. Public institution interests will surely argue that they have better uses for the state's higher education funds than providing subsidies to more students to attend high-priced private schools. Second, the logic of encouraging in certain ways, rather than uniformly limiting and regulating, intersector competition for students is difficult for many to understand, even in states with relatively strong promarket attitudes in general. Competition can be noisy and unsettling, and the other side of the competition coin is duplication of similar programs, which to many observers and participants in higher education policymaking simply looks like waste.[31]

The market-competitive model's approach to information policy — emphasizing the dissemination of information in usable form to consumers to guide their choices rather than amassing it at the state level to inform centrally made decisions — is also unfamiliar to many and relatively untested, though there are recent signs of increased interest in it.[32] There are also legitimate doubts about the sustainability over the long run of a truly open and competitive bidding and rebidding process for performance-based contracts [46, 55]. Finally, one might well wonder what happens under a market-competitive regime when competition threatens the demise of a public institution or, for that matter, a politically well-connected private one. In short, the most important open questions about the viability of a market-competitive-oriented regime are likely to be ones of *political* economy rather than pure economics. Still, the nonintrusive nature of this approach makes it intriguing to those attracted to the market responsiveness, flexibility, and autonomy that characterize many institutions in the private higher education sector.

As with the other postures, one would expect historical and cultural factors to play an important role in determining which states might lean in the market-competitive direction with respect to policies toward private higher education. To the extent that these factors are captured by regional differences, we might expect to see this posture tend to come closest to fruition in the southern and western states where promarket values are strong, especially in states where the private sector is large enough to attract policymaker attention but not so large as to successfully take a place in a cartel-like central-planning regime. The connection of the market-competitive orientation to state wealth is not entirely clear, but one might expect it to be less attractive to the poorest states, where there will be resistance to large student aid programs benefiting the private sector, and to the wealthiest states, where concerns with cost-effectiveness in higher education may not be prominent, than it will be to states in the middle-range on wealth measures. Finally, one would expect states with coordinating board governance arrangements to be more attracted to this rather hands-off, level-playing-field approach than states with a board holding line authority over the public institutions.

Now I turn to the task of examining these policy posture constructs empirically to see if they are at all descriptive of the mix of state policies actually in place in this field and to see which state characteristics (region, private sector enrollment share, state wealth, governance structure, etc.) are associated with which types of policies. The empirical analysis also considers the relationship of a state's policy posture toward the private sector to total state and local spending on higher education, as well as to proxies for other important policy concerns, that is, to overall participation in higher education and to an indicator of quality in public higher education.

Empirial Analysis of State Policy Posture Constructs

Cluster analysis was used to see whether the a priori notions outlined above about state policy postures toward private higher education bear any useful relationship to empirical reality. The policies used in this analysis were the six described earlier. Except as noted below, all the analyses presented in this section cover 48 states: Wyoming has no private nonprofit collegiate institutions based within the state, and for Maine and the District of Columbia data on some of the variables were not available.

Initially, hierarchical cluster analysis (without preconditions) was employed using the six state policy variables to get an idea of how the 48 states tended to cluster on these dimensions. This technique simply measures the sum of the squared distances between, in this case, states in a six-dimensional space based on the states' scores on the six policy variables,[33] divides the states into any number of clusters the analyst specifies, and provides various measures of dimensionality and the closeness of particular states to one another in terms of these policy dimensions [41]. For convenience, the results of the three-, four-, and five-cluster versions of this analysis are shown in Table 7 (or described in footnotes). Hereafter any reference to these clusters will use the four-cluster version of the analysis that is featured in the table.[34] This initial purely empirical analysis with no preconditions provides useful perspective in interpreting the results from the subsequent analyses which

TABLE 7

Hierarchical Cluster Analysis Results: State Policies That Affect Private Higher Education ($N =$ 48 states[a] in Four Clusters)

Cluster One[b] ($N = 21$)	Cluster Two[b] ($N = 13$)	Cluster Three ($N = 13$)	Cluster Four ($N = 1$)
Alaska	Alabama	Connecticut	Florida
Arkansas	Delaware	Illinois[c]	
Arizona	Iowa	Indiana	
California	Louisiana	Maryland[c]	
Colorado	Massachusetts	Michigan	
Georgia	Missouri	Minnesota	
Hawaii	Rhode Island	New Hampshire	
Idaho	South Carolina	New Jersey[c]	
Kansas	South Dakota	New York[c]	
Kentucky	Tennessee	Ohio	
Mississippi	Vermont	Oregon	
Montana	Washington	Pennsylvania	
North Carolina	Wisconsin	Virginia	
North Dakota			
Nebraska			
New Mexico			
Nevada			
Oklahoma			
Texas			
Utah			
West Virginia			

SOURCE: Analysis by the author based upon data from [66].

[a] Maine, Wyoming and D.C. not included due to lack of data.

[b] Cluster one and cluster two are combined in the three-cluster version of the analysis.

[c] Illinois, Maryland, New Jersey, and New York form a subcluster in a 5-cluster version of the analysis.

are based on prespecified criteria reflecting the state policy posture categories.

These latter analyses were based on the following characterizations of each of the three constructs of state policy regimes:

Laissez-faire states:

- Tuition level in public nstitutions: low.
- State student aid effort: low (see note 33).
- State contract or other direct subventions to private institutions: no.
- Private sector involvement in state higher education planning: occasionally involved or not involved.
- Duplication of private sector programs a criterion in state review of proposed new programs by public institutions: no.
- Extent of state mandates and regulation affecting private colleges and universities: scored 0 or 1 (low-end values on a zero-three [four-point] scale).

Central-planning states:

- State contracts or other direct subventions to private institutions: yes.
- Private sector involvement in state higher education planning: extensively or somewhat involved.
- Duplication of private sector programs a criterion in state review of proposed new programs by publics: yes.
- Extent of state mandates and regulation affecting private colleges and universities: scored 2 or 3 (high-end values on a zero-three [four-point] scale.

No values were specified for tuition level in public institutions or state student aid effort because these policies are considered less intrinsic to the central-planning policy regime than the other types of policies listed above. However, as suggested earlier, the expectation is that central-planning-oriented states will tend to have high levels of spending on student aid and moderate or high public institution tuition.

Market-competitive states:

- Tuition level in public institutions: high or moderate.
- State student effort: high.
- State contract or other direct subventions to private institutions: yes.
- Private sector involvement in state higher education planning: somewhat or occasionally involved (mid-range values on a zero-three [four-point] scale).
- Duplication of private sector programs a criterion in state review of new programs proposed by public institutions: no.
- Extent of state mandates and regulation affecting private colleges and universities: scored 1 or 2 (middle range on a zero-three [four-point] scale).

Note that some of the criteria for membership in this policy cluster overlap with the criteria for the central-planning cluster. Both are activist state policy regimes in clear contrast to the laissez-faire approach. The market-competitive regime, with its substantial state funding involvement, necessarily has some level of state regulation and participation of the private sector in planning, but it has less than the central-planning model. In sharp contrast to the central-planning regime, the market-competitive state worries little about public/private program duplication.

The basic analytic strategy was first to specify very strict criteria for a state's qualification into one of the above constructs and then to see what effect some relaxation of the qualification criteria might have.

Also, I looked explicitly for hybrid cases where policies seemed to be a true mix across the policy regime types, as well as for cases where none of the constructs or hybrids fit well. Table 8 shows the results of the analysis in a form displaying the major alternative ways of viewing the data while imposing on it what seems to be the most logical structure.

The upper left part of the table shows the laissez-faire cluster of states. The 14 states in the laissez-faire box are distinct from the other states in that they do not qualify for any of the other clusters by any reasonable set of criteria, and all but one of them (South Dakota) were grouped together in cluster one in the initial, strictly empirically driven hierarchical cluster analysis.[35] As the spaces that separate the groups within the laissez-faire cluster show, 4 states are laissez-faire in the strongest sense: they qualify on all six of the policies that affect private higher education. Another 5 states qualify on five of the six policies, and 5 more qualify on four of the six policies. It is interesting to note that of these 14 states whose higher education policies ignore or largely ignore the private sector, 12 are in the West or Plains regions and the other 2 are Southern states.[36] States in the West and Plains regions tend to have lower proportions of higher education enrollments in private institutions than is true in the other regions. These regularities will seem quite plausible to students of state higher education policy, and they fit with the expectations outlined earlier.

The pure central-planning cluster (upper right part of table) is defined strictly (four of four central-planning-oriented policies are required to qualify) and includes just five states. Note that 4 of these 5 states were grouped together in the hierarchical cluster analysis and the 5th, Florida, formed its own "cluster" in this analysis (but was most similar to hierarchical cluster three according to the cluster analysis dendrogram). Another 14 states had three of the four central-planning-oriented policies in place, but all of these also displayed substantial elements of the market-competitive policy regime; they were therefore placed in the hybrid category shown at the middle right part of the table. As expected, the 5 "pure" central-planning states tend to have relatively high levels of tuition in their public colleges and universities (3 of the 5 states are in the highest tuition category and a 4th is in the moderate tuition category), and above-average spending on state student aid (3 of the 5 qualify as high student aid effort states, and a 4th is close). These states also have sizable private sector market shares, as expected. Three of the 5 central-planning states are in the Northeast (Maryland, New Jersey) or Midwest (Illinois), consistent with expectations, and 1 is in the South (Florida), and surprisingly, 1 is in the West (Oregon).[37]

The market-competitive policy cluster (lower left in table) includes 8 states, 2 of which qualify on all six policies and 2 more on five of the six

TABLE 8

State Policy Postures Toward Private Higher Education

Laissez-Faire (LF) Cluster ($N = 14$)

States	No. of Criteria Met	Hierarchical Cluster
Arizona	6 of 6	1
Arkansas	6 of 6	1
Idaho	6 of 6	1
Nevada	6 of 6	1
Alaska	5 of 6	1
Hawaii	5 of 6	1
Mississippi	5 of 6	1
Montana	5 of 6	1
New Mexico	5 of 6	1
Kansas	4 of 6	1
North Dakota	4 of 6	1
Oklahoma	4 of 6	1
South Dakota	4 of 6	2
Utah	4 of 6	1

LF/MC Hybrid Cluster ($N = 4$)

States	No. of Criteria Met.	Hierarchical Cluster
Delaware	LF = 4 of 6 MC = 4 of 6	2
Kentucky	LF = 5 of 6 MD = 4 of 6	1
Nebraska	LF = 5 of 6 MC = 4 of 6	1
Vermont	LF = 4 of 6 MC = 5 of 6	2

Market-competitive (MC) Cluster ($N = 8$)

States	No. of Criteria Met	Hierarchical Cluster
Georgia	6 of 6	1
Michigan	6 of 6	3
Rhode Island	5 of 6	2
Wisconsin	5 of 6	2
Colorado	4 of 6	1
New Hampshire	4 of 6	3
North Carolina	4 of 6	1
Texas	4 of 6	1

Central-Planning (CP) Cluster ($N = 5$)

States	No. of Criteria Met	Hierarchical Cluster
Florida	4 of 4	4
Illinois	4 of 4	3
Maryland	4 of 4	3
New Jersey	4 of 4	3
Oregon	4 of 4	3

CP/MC Cluster ($N = 14$)

States	No. of MC Criteria Met**	Hierarchical Cluster
Pennsylvania	6 of 6	3
Virginia	6 of 6	3
Iowa	5 of 6	2
Massachusetts	5 of 6	2
Ohio	5 of 6	3
South Carolina	5 of 6	2
Tennessee	5 of 6	2
Alabama	4 of 6	2
Connecticut	4 of 6	3
Indiana	4 of 6	3
Louisiana	4 of 6	2
Minnesota	4 of 6	3
Missouri	4 of 6	2
New York	4 of 6	3

**All CP/MC hybrids meet 3 of 4 CP criteria

Other States* ($N = 3$)

States	Hierarchical Cluster
California	1
Washington	2
West Virginia	1

*Failed to qualify for any cluster or hybrid.

SOURCE: Analysis by the author based upon data from [66].

policies, while 4 states have only four of the six market-competitive policies in place and might therefore be regarded as *weak* market-competitive states. These 8 states qualify for the market-competitive cluster *only,* they are not hybrids (i.e., they are not close to meeting the criteria for the central-planning or laissez-faire clusters).

Two of the states in the central-planning/market competitive hybrid cluster (Pennsylvania and Virginia) also have all six of the market-competitive policies in place, and 5 more states in this hybrid category are market-competitive on five of the six policies.[38] In addition, 1 state, Vermont, from the laissez-faire/market-competitive hybrid cluster (left-middle of table) has five of the six market-competitive policies. Each of the 4 states in the laissez-faire/market-competitive hybrid has four or five laissez-faire policies in place as well as four or five that qualify as market-competitive.

To conclude, note that only 3 of the 48 states included in the analysis (California, Washington, and West Virginia; see lower right corner of table) do not fit into any of the specified categories of policy regimes. With some empirically plausible conception now of how state policies that affect private higher education are linked, I turn to a systematic examination of the correlates of these policies and postures. The purposes again are to begin to understand both from where these policies and policy configurations come and also to illuminate the issues around classes of strategies for possible policy intervention in the different types of states.

Correlates of State Policies and Policy Postures

In this section I will first explore the highlights of relationships between certain state characteristics (and other important state-level variables) and key state policies affecting private higher education. Then I will examine systematically the relationships between these state-level variables and state policy *postures* (the categories described and analyzed above) toward private higher education.

Regional Variations

As noted earlier, a majority of states in three regions (the Northeast, Midwest, and South) have contract or other programs that provide state funds directly to private colleges and universities, whereas none of the 18 states in the Plains and Western regions have such programs. There are sharp regional differences on the other policies that are of interest too. For example, state student aid grant spending averaged $212 per FTE undergraduate in the 8 Midwestern states and $207 in the 12 Northeastern states. But it was little more than half as large in the 13 Southern states ($108 per student) and averaged just $48 in both the Plains states and the West. Similarly, public sector tuition was classed as high [13] in 9 of the 11 Northeastern states and moderate in the other

2, whereas in the Midwest 7 of the 8 states were classed as high-public-tuition states, and 1 was classed as moderate. But in the South only 1 state was high, 6 were moderate, and 6 were low. The Plains region was somewhat similar to the South; 4 states were in the moderate and 1 in the low category, whereas the West had mostly low-tuition states; 9 were in this category, and the remaining 4 were in the moderate category. These data certainly reinforce the well-known idea that basic patterns in the history, politics, laws, and economics of states located in different regions have important effects on their policies affecting private higher education. Many of these factors, such as constitutional provisions, basic political alignments and economic status, are unlikely to change rapidly, which suggests that at least some broad constraints exist that govern policy change efforts.

Private Sector Share of Enrollment

Another factor that might well be expected to affect state policies toward private higher education is that sector's share of total statewide higher education enrollment. If a larger share of a state's enrolled students are in the private sector, it is logical for both substantive and political reasons that public policy pay more attention to this sector.[39] Indeed, the correlation between private enrollment share and state student aid effort is positive and strongly significant ($r = 0.41, p < 0.01$), as expected. The impact of the private sector's "market share" on policy is also suggested by the fact that the 21 states with programs providing state funds directly to private institutions have a mean private market share of 28.2% (median = 23.9%), compared to a mean of 19.9% (median = 15.1%) for the 30 states with no such programs.[40] States with larger private market shares also tend to have higher tuition in their public colleges and universities. The mean private sector share of enrollment in the high-public-tuition states is 30.6%, compared to 21.6% in the moderate-tuition states and 14.3% in the low-tuition states.[41] Private market share seems also to be related to private sector involvement in state higher education planning.[42] Private market share is correlated with the extent of state mandates and regulation affecting the private sector ($r = 0.39, p < 0.01$), suggesting that the reach of such mandates is affected by the significance of the potential targets. Finally, private market share is not significantly correlated with whether or not a state takes duplication of private sector programs into account in reviews of proposed new public institution programs (but the sign on the correlation coefficient is positive). Thus, the expected association between the private higher education sector's relative importance in a state and the state's policies toward it is, in general, present.

A likely mechanism by which private sector enrollment share influences state policies is via state relations efforts, that is, lobbying and the like. One proxy measure of lobbying efforts that is available for 27 of the states via the ECS survey is expenditures of the statewide private higher education association (although these associations also have some other functions).[43] In addition to the small number of cases, the state associations which did not exist or did not provide this possibly sensitive information tended to be the states with small private sectors and less favorable policies toward this sector, thus making robust relationships doubly difficult to find in the data for the remaining states.

The results are not robust, but there is a weak positive relationship between private sector enrollment share and association expenditures ($r = 0.30$), although it is not statistically significant at even the 0.10 level. Interestingly, for these 27 states the correlation between the state association's expenditures and state student aid effort (spending on student aid grants per student), generally one of the organization's primary thrusts, is stronger than the relationship between private market share and the association's budget and is statistically significant ($r = 0.40$, $p < 0.05$). A multiple regression analysis seeking to account for state student aid spending as a function of private market share *and* private sector association budget produced surprisingly strong results, although these should be regarded as only suggestive in light of the limited data and dearth of controls. This simple linear model accounted for nearly 50% of the variance in state student aid effort across the 27 states ($F = 13.94$, $p < 0.0001$). The standardized regression coefficient for the private market share variable was $\beta = 0.64$ ($p < 0.001$), while the coefficient for state association spending independent of market share was positive but not significant.

State association spending by the private sector also gives some evidence of being positively associated with other state policies desired by this sector, including the level of public higher education tuition, the presence of state programs providing funds directly to private institutions, and the extent of private sector involvement in state planning for higher education.[44] Although these findings are less than definitive statistically, taken together they are consistent with the plausible notion that private higher education's expenditures on legislative relations bear fruit in terms of state policies[45] and that these expenditures tend to be larger where the private sector's market share is larger.

Other State-level Variables

Several other state-level variables were explored in an effort to develop a more complete picture of what characterizes states with larger versus smaller shares of enrollment in the private sector and with particular types of policies that affect this sector. Table 9 summarizes some of the major findings from these analyses. Note first that state wealth (personal income per capita, third line in table) is positively related to both private sector share of state enrollments in higher education and to state spending on student aid grants. It also seems to be related to the presence of state programs that provide funds directly to private colleges and universities.[46] The most plausible interpretation for this set of relationships is probably that the states with larger private sectors tend to adopt policies that are more favorable toward this sector (as was suggested above) and that these happen to be, in general, wealthier states. These relationships also suggest that the states with less favorably disposed policies toward private higher education might have difficulty in altering this disposition (at least with respect to policies entailing significantly increased new spending), should they choose to do so, due to their lower proportion of enrollments in private institutions and their lower wealth.

This notion is reinforced by the observation that state/local "tax effort" (government tax and other general revenue collections divided by personal income) tends to be higher in states with *lower* shares of enrollment in the private sector. The bottom row of the table indicates a modest negative correlation between state tax effort (i.e., burden) and private sector market share. Also (not shown in table), the states with*out* programs that provide funds directly to private institutions have

TABLE 9

Pearson Correlation Coefficients among Key State-Level Variables (1987–88 data, except as noted)

State Characteristics ($N = 51$)	Private Sector Share of Total Enrollment[a] Coef/Sig Level	Estimated State Student Aid Spending per Student[b] Coef/Sig Level
Private sector share of total enrollment[a] ($N = 51$)	na	0.41***
State spending on higher education per capita[c] ($N = 51$)	−0.52***	NS
State personal income (PI) per capita[d] ($N = 51$)	0.43***	0.34**
State and local general revenue per capita[e] ($N = 51$)	NS	NS
State tax effort (General Revenue/PI)[f] ($N = 51$)	−0.24*	NS

[a] [52, p. 142].
[b] [38 (1988), p. 146].
[c] [1, p. 145].
[d] [1, p. 8].
[e] [1, p. 137].
[f] [1, p. 137].
*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

significantly *higher* tax effort levels than do states with such fiscal links to private higher education.[47]

A picture thus begins to emerge of a tendency for states with smaller private sectors and less favorable policies toward this sector to be less wealthy states that are already making a significantly larger tax effort than their peers with more favorable policies. This suggests that it would not be easy for these states to move in the direction of more favorable policies toward private higher education because of their immediate and politically visible costs, even if in the long run it might be cost-effective to do so.[48] Yet, some utilization of such policies might well prove cost-effective over the next few years for the many states expected to see sharply growing demands for places in higher education and who would otherwise presumably have to expand public sector capacity by adding costly new facilities and faculty.[49]

Overall State Spending on Higher Education and State Policies toward the Private Sector

It is plausible that having a large private college and university sector would permit a state to spend less public money on higher education than it otherwise would, for it should not have to provide large per student subsidies to public institutions for as many students. Indeed, increased expenditures on student aid programs and other measures helpful to the independent sector's attractiveness and capacity could, depending on capacity and demand patterns, conceivably reduce total higher education costs to taxpayers by reducing the need for public sector capacity.

Such a proposition is difficult to test definitively, but analysis for a single year (1987-88 or 1988, depending on the variable) of some of the key relationships between total state and local spending per capita on higher education[50] and such variables as private enrollment share, state wealth, state tax effort and other state characteristics, and state policy variables such as state student aid effort and presence or absence of programs under which independent institutions receive state funds is suggestive. The correlation between *higher* private enrollment share and *lower* total public spending on higher education per capita is rather strong ($r = -0.52, p < 0.0001$). The simple dichotomous variable, absence/presence of state programs providing state funds directly to independent colleges and universities, is inversely and significantly correlated with total state/local higher education spending per capita ($r = -0.38, p < 0.01$).[51] Controlling for the influence of private market share on total state higher education spending by entering it first in a multiple regression analysis seeking to account for this spending reduces the magnitude of the coefficient on the presence-of-state-programs variable, but the latter's sign remains negative and significant ($b = -0.27$, $p < 0.05$).[52] According to these regression results, the presence of such programs is associated with *lower* overall state/local higher education expenditures by $39 per capita relative to their absence.[53]

Overall, these findings are consistent with the plausible notion advanced initially that a larger private sector enrollment share should tend to save state taxpayers money they would otherwise likely spend on public higher education capacity. The bivariate regression between these two variables implies that an increase of one percentage point in the private sector's share of statewide enrollment is associated with *lower* overall state/local spending on higher education of $2.28 per capita (+ or −$0.54, $p < 0.0001$), or put another way, $11.4 million annually in a "typical" state with a population of 5 million.[54] Of course, this is only a way of describing a bivariate relationship, it does not imply that shifting 1% of a state's enrollment across sectors will save this sum. Yet, the idea that directing a larger share of any *increasing* enrollment into the private sector should save the state taxpayer money is entirely plausible. The extent of savings will depend upon the incremental cost of public sector expansion compared to the per student cost to the state of enticing some of the additional students into the private sector via student aid, direct payments to the institutions, better information, or some combination of such measures.

Interestingly, a multiple regression analysis of per capita state and local spending on higher education on a variety of variables that might be expected to be related to this variable[55] produces a coefficient on private market share that is somewhat lower than the bivariate coefficient but still strong ($b = -\$1.85$, $p < 0.01$).[56] When the explanatory variables are entered stepwise in order of strength of relationship with per capita state/local spending on higher education, *private market share is the first variable to enter the equation.* Next comes state tax effort, which is positively correlated with spending on higher education. Significantly, at this point the dichotomous variable for absence/presence of state programs that provide funds directly to private institutions retains an *inverse* relationship to overall state spending on higher education at a marginally significant level ($p < 0.051$). So, although private market share is correlated with this and other variables reflecting favorable policies toward the private sector, this particular programmatic variable's relationship to state spending on higher education is in some measure independent of private market share.[57]

Policymakers might be concerned that a configuration of policies directing more students into the private sector of higher education could lead to lower spending per student in public institutions (if the programs to lure more students into the private sector drained state resources) or to lower overall participation in higher education (if it meant that higher education became substantially more costly to students on average). Cross-section analysis cannot answer these objections completely, for these effects could occur within a state over time, but an examination of the zero-order correlations among the relevant variables does not suggest any cause for concern. Overall (public and private) participation rate in higher education of the population aged 17 and over is essentially uncorrelated with both state student aid spending and the presence of state programs that provide funds directly to private institutions and is *positively and fairly strongly* correlated ($r = 0.46, p < 0.001$) with private sector share of enrollment. Thus it is unlikely that policies that favor private institutions have worked in any significant way to undermine overall participation in higher education. More likely they have enhanced it, if they have had any effect.

The level of spending per student in public institutions — a crude measure of quality in this sector or at least of effort to achieve it — also does not seem to be affected by private market share, the level of state student aid spending, or by the presence of programs that provide state funds directly to private institutions, at least according to the bivariate correlations. Finally, when these variables are added to the multiple regression analysis seeking to account for total state/local spending on higher education per capita, the private market share variable remains highly significant and its negative coefficient actually increases in absolute magnitude: ($b = -\$3.45, p = 0.0000$).

State Governance Structure

Another potentially important state-level variable, one which can be thought of as a policy lever available to affect the behavior and outcomes of the system, is state higher education governance structure. There are two basic structural forms for state-level governance of higher education. One is the state *coordinating board* form, where the board has responsibilities as the name implies: data collection; planning and policy analysis for state policymakers on issues that cross institutional boundaries; usually (but not always) a role in program review, especially of new programs proposed by public institutions; sometimes a substantial advisory role in state budgetary decisions for higher education; but no direct role in managing institutions. The second broad type is the consolidated (or statewide) *governing board,* which has line responsibility for managing all the state's public institutions, or in some cases, just the public four-year institutions. The governing board may also be charged with broader responsibilities for higher education planning and the like, or yet another agency may be created for this purpose. A few states have neither of the major types of governance agencies but only an advisory planning body, and a few others have one of various hybridized forms [31].

It has been proposed by scholars of higher education that consolidated governing board arrangements for state-level governance, because of their primary focus on the public sector, make it more difficult for the private sector to be taken seriously in state higher education policymaking than is the case under a coordinating board regime [4, 18, 35, 59]. Concerns about the statewide governing board form could also arise out of worries about excessive bureaucratization [35] and from the argument made in the political economy literature that cartel-like arrangements for organizing the delivery of public services — consolidated governing boards in higher education function in some respects like cartels — make it likely public policy decisions will tend to favor "producer" interests at the expense of the public interest and will tend to involve higher levels of public spending.[58]

Although state higher education governance structures lend themselves to many classifications [3, 31, 35], here I will consider only the two most common forms:[59] the regulatory coordinating board instances, where the board has approval authority over new programs proposed by public institutions, and the consolidated governing board cases, where there is no additional planning agency for higher education. Nineteen states fell into each of these categories in 1987 [31].

The data on state policy outputs regarding policies that affect private higher education suggest that these two major types of state governance structures tend to behave differently, as hypothesized. The regulatory coordinating board states tend to have policies that are more favorable to the private sector of higher education. In particular, the regulatory coordinating board states spend on average almost twice as much per student on student aid as the consolidated governing board states ($173 vs. $91). Thirteen of the 19 states with such coordinating boards (68%) have programs that provide state funds directly to private institutions, whereas only 5 of the 19 states with consolidated governing boards (26%) have such programs. Also, the coordinating board states are more likely to be in the high and moderate categories in terms of the level of tuition in the public higher education sector and much less likely (16% vs. 42%) to be in the low-tuition category than are the governing board states. And, according to reports by state higher education agency executives on the ECS survey, the private sector in the coordinating board states tends to be more extensively involved in state planning for higher education.

Significantly, an analogous pattern of differences appears between these two groups of states with respect to per capita state and local spending on higher education. The states with regulatory coordinating boards spend significantly less ($235 on average, median = $234) than the governing board states (mean = $274, median = $269). That this is not simply a product of the typically smaller market share of the private sector in the governing board states is suggested by, first, the fact that the average difference on this variable is small (24.1% mean market share for the private sector in the coordinating board states versus 21.2% in the governing board states), and more significantly, by multiple regression analysis results. In regressions of the total per capita state/local higher education spending variable on private sector market share and various formulations of the state higher governance structure variable, the regulatory coordinating board structure does seem to be associated with lower per capita spending, after the effect of private market share is accounted for.[60]

Finally, it is notable that the states with governing boards can least afford their generally higher spending on higher education. Their personal income per capita averaged just $13,783, compared to the national figure of $14,758 and to $15,110 for the states with regulatory coordinating boards. The governing board states were also spending more of their income on state and local government (higher "tax effort") than were the coordinating board states, by 17.4% to 15.4%. Thus state higher education governance structures appear to be related not only to policies that affect the private sector, but also to total taxpayer spending on higher education. Unlike some other variables, state governance structure can be addressed directly by policy.

Correlates of State Policy Postures

Because I have argued here that thinking of states' policies toward private higher education as linked in understandable ways makes both normative and empirical sense, it is important to explore how the state policy posture categories described earlier relate to state characteristics and to other state variables of interest, such as state governance structure, overall participation rates in higher education and state spending on higher education overall and per student in public institutions. This analysis will help in the subsequent effort to think about the design of viable and effective policies for different types of states. The analysis has two phases. First, the highlights of the differences between the state policy clusters in terms of central tendency and distributions on the key state-level variables will be described and interpreted. Then, some exploratory results will be summarized of multiple discriminant analyses designed to see how distinct the clusters are in terms of these variables and which variables are most strongly associated with particular policy postures after appropriate controls for the effects of the other variables.[61]

Table 10 shows the mean and standard deviation for each of the continuous state-level variables for all six policy posture clusters. Table 11 depicts the distributions of each cluster on the two categorical variables, region and state higher education governance structure.[62] The laissez-faire states are all in the Plains, the West, or in a few cases the South, a geographic pattern that is not surprising in light of the earlier discussion. Also as expected, the laissez-faire states tend strongly toward the consolidated governing board model of state governance. They have the lowest mean private sector market share and state wealth of any policy cluster but as a group make the *highest mean tax effort.* The net effect is well above average taxpayer spending on higher education in these relatively penurious states.

Significantly, though mean population growth in the laissez-faire states was the most rapid of any policy cluster, the mean private sector enrollment growth rate was below average (though highly variable). The mean higher education participation rate in the laissez-faire states was very close to the 47-state figure, and the indicator of quality in public colleges and universities (spending per student) was somewhat below the national (47-state) norm in spite of these states' high tax effort. These patterns suggest that the laissez-faire states are working very hard to stay not quite even in terms of higher education participation and quality, while their private institutions are getting little state help — which is not surprising given the limited size and thus probable influence of their private sectors and the predominance of state governance structures that have a built-in tendency to overlook the private sector — and are generally not doing particularly well in enrollments in spite of favorable population trends. Thus, these institutions are not helping the state bear its burdens in higher education as much as they might. Yet, higher education burdens in most of these states will be heavy indeed in the coming decade (see Figure 1).

The 4 states with a mix of laissez-faire and market-competitive policies are quite different on most dimensions from the laissez-faire states. Not only is their regional distribution and mode of state governance of higher education notably different from the laissez-faire states, they are not far from average in wealth and private market share, whereas the laissez-faire states are lowest of all the clusters on these measures. As a group they are identical to the laissez-faire states in tax effort (high). Thus, it is not surprising that mean spending on higher education per capita and public institution spending per student are the highest of any cluster. Recent enrollment growth in the private sector has been on av-

TABLE 10

Distribution of State Policy Posture Clusters on State Characteristics Variables

	Total Population (47 states)	Laissez-faire Cluster ($N = 13$)	LF/MF Hybrid ($N = 4$)	Market-competitive Cluster ($N = 8$)	CP/MC Hybrid ($N = 14$)	Central-planning Cluster ($N = 5$)	Unclassifiable States ($N = 3$)
Variable: Pvt. enrollment share							
Mean	22.6%	14.0%	23.3%	26.5%	30.3%	21.1%	15.0%
Std. Dev.	13.5	10.5	14.6	16.6	13.4	5.1	0.9
Variable: State wealth (pers. income per cap.)							
Mean	$14,624	$12,988	$14,346	$15,035	$15,130	$16,909	$14,813
Std. Dev.	2,478	1,834	1,893	1,302	2,851	2,425	3,468
Variable: State tax effort (Gen. rev./PI)							
Mean	16.2%	16.9%	16.9%	15.8%	15.8%	15.5%	16.3%
Std. Dev.	1.9	2.1	1.6	1.5	2.3	1.7	0.3
Variable: State pop. growth rate, 1980–88							
Mean	8.2%	10.8%	6.0%	10.6%	4.2%	9.5%	9.4%
Std. Dev.	7.9	9.8	4.8	7.2	4.1	9.9	12.0
Variable: Pvt. hi. ed. growth rate (1982–88)							
Mean	6.8%	4.7%	11.3%	8.1%	8.9%	3.9%	1.6%
Std. Dev.	21.0	36.7	8.5	10.0	11.3	15.6	9.2
Variable: St/local spdng. on hi. ed. per cap.							
Mean	$ 259	$ 276	$ 315	$ 259	$ 240	$ 228	$ 262
Std. Dev.	66	64	72	61	66	64	64
Variable: Adult particptn. rate in hi. ed.							
Mean	6.46%	6.44%	6.35%	6.85%	6.25%	6.36%	6.84%
Std. Dev.	1.36	1.73	1.45	1.47	1.01	1.31	1.55
Variable: Public hi. ed. quality ($per stud.)							
Mean	$ 6,979	$ 6,816	$ 8,232	$ 7,017	$ 7,381	$ 5,700	$ 6,166
Std. Dev.	1,324	1,461	1,374	730	1,285	1,015	686

SOURCES: [1, 53].

NOTE: For reasons explained in the text, Alaska, District of Columbia, Maine, and Wyoming are excluded.

TABLE 11

State Policy Posture Clusters by Region and by State's Higher Education Governance Structure

Region	Laissez-faire Cluster	LF/MC Hybrid Cluster	Market-competitive Cluster	MC/CP Hybrid Cluster	Central-planning Cluster	Unclassifiable
Northeast	0	2	2	4	2	0
Midwest	0	0	2	5	1	0
South	2	1	3	5	1	1
Plains	4	1	0	0	0	0
West	7	0	1	0	1	2
Total (states)	13	4	8	14	5	3

State Higher Education Governance Structure	Laissez-faire Cluster	LF/MC Hybrid Cluster	Market-competitive Cluster	MC/CP Hybrid Cluster	Central-planning Cluster	Unclassifiable
Statewide governing board	10	0	4	2	0	1
Regulatory coordinating board	1	1	2	11	3	1
Other[a]	2	3	2	1	2	1
Total (states)	13	4	8	14	5	3

SOURCE: Analysis by the author based upon data from [66].

NOTE: For reasons explained in the text, Alaska, District of Columbia, Maine and Wyoming are excluded.

[a] Includes states with planning agency (4) or advisory coordinating board (4) only and states with a statewide governing board plus a planning agency (3).

erage the most rapid of any cluster, although population growth in these states averaged well below the national norm. Overall higher education participation is a bit below average.

It is difficult to generalize from four cases, but perhaps the less unfavorable policy mix combined with reasonable population growth helps account for the private sector's healthy growth in these states in comparison to the pure laissez-faire states, while the combination of high wealth and high tax effort has led to high levels of spending on public higher education. The significant private sectors in the hybrid states, but limited programs involving them, suggest that there may be opportunities for policymakers to induce these sectors to serve their states even more than they have been, particularly if population growth continues as expected.[63]

At the other extreme from the laissez-faire policy posture are the 5 central-planning states. Only 1 of these (Oregon) is west of the Mississippi, and 1 (Florida) is in the South. The others are in the Northeast and Midwest, as expected. Three have the regulatory coordinating board form of state governance, while the other two have one of the less common forms. As expected, none are governing board states. These states as a group are a little below average in private sector share of enrollment. They are by a good margin the wealthiest group of states on average and presumably for that reason are able to make the lowest tax effort. Interestingly, their mean spending on higher education per capita is the *lowest* of any group, which is reflected in their having the lowest average spending per student in the public sector. Their overall participation rate in higher education is a bit below average. Population growth in these states has been above average, but the mean enrollment growth rate for private institutions has been well *below* the national (47-state) figure, though quite variable. Thus, this group of central-planning-oriented states heavily manages its higher education system but has been spending relatively little on it and does not seem to have been getting particularly impressive results in terms of quality, access, or private-sector growth as a result. Yet, all 5 of these states are expected to face increases in numbers of high-school graduates in this decade (in Florida, Maryland, and Oregon the increases will be large) and thus might be well served by policies that encourage more growth in the private sector.

The 8 market-competitive states are fairly well spread out regionally, though Colorado is the only one from the Plains or West regions. Interestingly, 4 of these states have statewide governing boards, 2 have regulatory coordinating boards, and 2 have one of the other governance forms. The states in the market-competitive cluster tend to have relatively high private sector market share, as might be expected. These states are slightly above average in wealth but somewhat (7%) below average in tax effort (second-lowest among the policy clusters). Overall per capita spending on higher education is essentially identical to the national figure and spending per student in the public sector is also little different from the norm.

Significantly, the mean participation rate in higher education in the market-competitive states is the *highest among all six policy clusters* (although there is not a great deal of range across the clusters in mean values on this variable). Enrollment growth in private higher education in these states averaged nearly 24% above the 47-state figure, probably in part a function of the fact that their population growth was on average even further above (29%) the national norm. Still, it is entirely plausible that the market-competitive policy regime plays a role in leading to this rather salutary combination of "outcomes": a high participation rate in higher education and healthy growth in the private sector combined with average levels of spending on public sector students and on higher education overall, all achieved with below-average tax effort and only slightly above-average wealth.

The central planning/market-competitive hybrid policy cluster is large (14 states). These states are all in the Midwest, Northeast, or South. Eleven of them have a regulatory coordinating board governance arrangement at the state level, while 2 have a consolidated governing board, and 1 state has one of the other forms. These states have the highest mean private enrollment share of any cluster (30.3%). They are as a group above average in wealth, but only by about 3% and with a fairly high variance around the mean. They tend to be below average in state tax effort (7% below the national figure), but not as low as either the pure market-competitive or pure central-planning states. Their mean per capita spending on higher education is below average (by almost 8%), but spending per student in the public sector is above average. However, the mean higher education participation rate for these states is the *lowest* among all six policy clusters, although still less than 4% below the 47-state norm. This group of states had the lowest mean population growth rate over the years 1980–88, just a little more than half the national norm, but nonetheless had the second-highest growth rate of private collegiate enrollments (36% greater than the national norm).

In sum, the pattern here is most similar to that of the pure market-competitive states: modest spending on higher education overall, but still more-than-average spending per student in the public sector, and healthy enrollment growth in the private sector. The main difference is that the pure market-competitive states as a group lead all the other policy clusters in overall higher education participation, whereas the central-planning/market-competitive hybrid states are lowest of the clusters on this measure. Still, the difference is not large: 6.85% compared to 6.25% of the over-17 population enrolled.

Thus, at least at the level of within-group regularities, the market-competitive policy cluster and its cousin, the market-competitive/central-planning hybrid, seem to be associated with a more cost-effective set of policy outcomes than the laissez-faire-oriented policy clusters. In particular, the laissez-faire states, although they are generally poorer, tend to spend more on higher education per capita and to make a substantially higher tax effort overall, yet evidently do not realize higher than average participation rates in higher education as a result. In the case of the laissez-faire cluster, (though not the small laissez-faire/market-competitive hybrid), quality, as measured by spending per student in the public sector, is also below average in spite of the heavy fiscal effort expended. Probably not coincidentally, in light of their policies, recent private enrollment growth in these states was below average even though population growth was strong. Meanwhile, the market-competitive cluster of states boasted the most attractive set of outcomes: strong private sector enrollment growth and a high overall participation rate in higher education, average levels of spending on public sector students, and average spending on higher education overall, all achieved with below average tax effort and only slightly above average wealth.

Discriminating Power of Individual Variables

Multiple discriminant analysis was used as a means to try to identify the unique relationship between a state's membership in its policy cluster and its characteristics in terms of each of the several state-level variables just discussed. This section presents a brief summary of the results of this analysis.[64]

The six-cluster taxonomy of the 47 states' policy postures toward private higher education is modeled as a function of the following state-level variables:[65]

- private-sector share of state higher education enrollment;
- state personal income per capita (state wealth);
- state and local tax and other general revenue collected as a percentage of personal income (state tax effort);
- state and local spending on higher education per capita;
- spending per student in public higher education (public sector quality);
- overall (public and private) enrollment in higher education as a share of state population over 17 (participation rate);
- state population growth, 1980–88 (census estimates);
- enrollment growth rate in state's private institutions, 1982–88;[66]
- state governance structure, as represented by dummy variables for the two dominant forms, statewide governing board with 17 cases among the 47 states, and regulatory coordinating board with 19; the excluded case is three miscellaneous other governance forms that together account for 11 states (see footnote to Table 11).

Following the basic sequential logic of the multiple discriminant analysis procedure, the analytic approach was to seek to discriminate using these variables between meaningful groupings of states composed from the six policy posture clusters. Thus, optimal discriminant functions were successfully estimated to distinguish between, first, the 3 unclassified states and the rest, and then between the 4 somewhat anomalous laissez-faire/market-competitive hybrid states and the remaining 40 states.[67] The same procedure was then used to estimate functions that discriminate between the 13 laissez-faire states and the 27 states that fall into the central-planning, market-competitive, and central-planning/market-competitive hybrid clusters. Next, the 5 central-planning states were distinguished from the 22 market-competitive and central-planning/market-competitive hybrid states. Finally, the optimal function discriminating the 8 market-competitive states from the 14 hybrid states was estimated. In all cases the discriminant functions based upon the above explanatory variables were significant at better than the 0.005 level and classified between 80% and 90% of the states into the correct policy cluster. This indicates that the combinations of policies that are the basis for the cluster constructs and these state characteristic and policy outcome variables as a group are indeed related, a key validation of the basic line of analysis advanced here.

As for the strength of the individual state-level variables in distinguishing among the policy clusters, certain region dummies, private sector enrollment share, and the consolidated governing board form of statewide governance of higher education were found to have a statistically significant role individually in discriminating between the laissez-faire states and the "augmented cluster" of states consisting of the central-planning, market-competitive and central-planning/market competitive hybrid states.[68] In addition, the coefficients on state wealth, private sector enrollment growth and the regulatory coordinating board form of statewide governance had the expected signs (i.e., consistent with the bivariate relationships already described) and magnitudes at least approaching a significant contribution to the discriminant equation.

In discriminating between "pure" central-planning states on the one hand and the market-competitive and central-planning/market-competitive hybrids on the other, higher private sector enrollment share and public sector quality were both significantly associated with the latter grouping, again consistent with the central tendencies of the clusters absent any controls.[69] Finally, in distinguishing the pure market-competitive states from the central-planning/market-competitive hybrids, two variables were significantly associated with states' classifications: population growth rates tended to be higher in the pure market-competitive states, while the regulatory coordinating board governance structure was associated with the hybrid classification.[70]

Overall then, it seems fair to conclude that the multivariate analysis results are broadly consistent with those derived from the earlier examination of the patterns of central tendency in the characteristics of the states from the different policy clusters. While many of the bivariate relationships between the state-level variables and the states' classification into policy clusters do not emerge as statistically significant in the sequential multiple discriminant analysis just summarized — notably the relationships between classification as a laissez-faire state and (higher) state tax effort and state/local spending on higher education

— the signs on the relationships are nearly all consistent with the bivariates, and no real surprises are apparent. The state policy posture clusters then are both conceptually plausible and at least suggestively linked empirically to a number of state characteristics that help in understanding the probable origins of these policy combinations. Taken as a whole these results, together with the correlation and regression results advanced earlier, also provide an improved basis for policy analysis concerning the relationships between state policies and such high-priority concerns as overall higher education participation, public sector quality and total taxpayer spending on higher education.

Conclusions and Implications for Policy Design

The empirical results reported here, though not fully definitive statistically, strongly suggest several important conclusions. First, it has been shown clearly that states' policies that affect private higher education are not random but rather are systematically linked. States with higher student aid spending are significantly more likely to have programs that provide state funds directly to private colleges and universities, to have higher public sector tuition levels, to involve independent institutions in state planning, to have more mandates and regulations affecting private colleges, and so on. Second, it is possible to characterize most states' policy postures (made up of these policies) toward private higher education in terms of a few theoretically and intuitively plausible categories — the laissez-faire, central-planning and market-competitive constructs plus two hybrids of these — and to relate these systematically (although in some cases the individual relationships fall short of statistical significance) to both state characteristics and indicators of policy results in ways that are consistent with theory. This leads to some potentially significant, albeit tentative, policy implications.

First, we find that states which take a standoffish or laissez-faire attitude toward private higher education (low student aid spending, no direct fiscal linkages to private institutions, low public sector tuition, low involvement of the private sector in state planning, little concern for public/private programmatic competition, few mandates or regulations affecting the private sector) tend to be in the Plains and Western regions, to have relatively small private college and university sectors, to be generally low in wealth but high in tax effort and above average in per capita spending on higher education, and to employ the statewide governing board form of higher education governance. Not surprisingly, private institutions in these states tended to grow slowly during the 1980s, even though population growth was strong. Significantly, in many of these states population growth is expected to continue, thus creating growing demand for higher education.

Given this strong demand and the fact that even supporting their near-average levels of higher education spending and participation appears to be a financial burden on these low-wealth, high-tax-effort states, the policy implication is that they would do well to consider adopting more active policies to utilize their private higher education sectors more fully. The empirical analyses reported here are at least consistent with the plausible notion that state policies designed to level the playing field for the private sector — such as relatively generous portable student aid funding, competitive contracts and other direct fiscal linkages with private institutions where they have relevant capacity, and higher public institution tuition[71] — can in the long run reduce the aggregate need for taxpayer dollars for higher education by diverting some students from the public sector while boosting overall participation. This should be an attractive prospect indeed for policymakers in the generally poor, highly taxed laissez-faire states, if they can comprehend and articulate all the relevant linkages. One immediate policy step suggested by the analysis that might facilitate movement in this direction is to adopt state governance arrangements that have a less narrow, public-sector-only focus than is typical of the consolidated governing boards in most of these states.

Beyond this, the analysis has additional suggestive policy implications. The "pure" market-competitive policy posture is, at least in a bivariate correlational sense, associated with a generally salutary combination of state policy variables and characteristics. These states achieve the highest mean overall participation rate in higher education, a high growth rate in private sector enrollments, and average public sector "quality" (spending per student) with just average levels of per capita higher education spending and tax effort substantially below the national norm. Although causation has not been established, this set of policies is certainly plausibly associated with such results in light of the other findings reported here concerning associations between size of the private sector, policies broadly favorable to it, higher overall participation rates, and *lower* taxpayer spending on higher education.

Taken as a whole then, the findings suggest that steps in the market-competitive direction may be broadly desirable in state higher education policy. This would seem to be all the more true in an era when state dollars for higher education will be constrained while demands for student places will in many areas be growing substantially [65]. Where states are already at full capacity in their public systems, additional students will be costly to serve in this sector, because new capacity (buildings, permanent faculty, etc.) will have to be added. If student aid and other carefully designed incentives and other policies (e.g., appropriate regional planning, better consumer-oriented information for student choice of institutions) can lure some of these additional students into the independent sector at lower per student cost to the state, both participation and fiscal goals seem likely to be best served.

Nonetheless, the state postures analysis also suggests that not all states are likely to be readily oriented or reoriented toward the market-competitive constellation of policies. For historical, cultural, or whatever reasons, some states appear to lean toward a more heavily regulatory or centrally planned approach. The five "pure" central-planning states are the wealthiest on average of any of the state policy clusters studied, but they spend relatively little on higher education (including on quality in the public sector), have had below average growth in the private sector, and not surprisingly, have below average participation in higher education overall.

The results reported here might suggest that these states look to adding more competitive elements to their policy mix, particularly in the face of the strong growth in enrollment demand that some of them face. They might thus follow in the path of the group of central-planning/market-competitive hybrid states identified in the empirical analysis. These latter states still have low overall higher education participation but had strong private sector enrollment growth in the 1980s and above average public-sector quality, all with below average tax effort and per capita spending on higher education. Such a hybrid (e.g., with central-planning elements such as strong and fairly directive direct aid programs, continued substantial mandates and regulation of the private sector, and tight controls over intersector competition) may be more politically feasible in states with a strong central-planning tradition than a dramatic move toward a more wide-open competitive approach would be. Policy designs need to be politically viable as well as attractive from a cost-effectiveness standpoint.

Additional research is needed using more refined measures and experimenting with alternative specifications of the state policy posture constructs, as well as tracking the relationships between state characteristics, policies, and indicators of outcomes over time, to pinpoint more definitively the relationships at work in this area of state policies that affect private higher education. Also, finely tuned analyses, probably largely state-by-state due to widely varying circumstances and politics, will be needed to establish the precise relationships between the cost of state policies benefiting the private sector, such as student and institutional aid programs, and likely savings from reduced pressure on public higher education capacity. These analyses should be aided, however, by the conceptual framework offered here, because it helps to distinguish relevant basic differences among states, including differences in key external conditions and factors that affect political calculations. The present analysis also points toward other policy levers with little direct dollar cost, such as policies affecting public institution tuition levels, information policies, and arrangements for state governance of higher education.

States will do well to give careful attention to policies affecting private higher education and their costs and benefits to the taxpayer, for in the emerging era the watchword in higher education policy will be serving more demands with very tightly constrained tax dollars.

Notes

[1] Three states' policies are unclassifiable into any of the categories and so form a residual category.

[2] Japan is an interesting exception. See [19].

[3] The figures are from [16].

[4] However, if two-year institutions are excluded, the private nonprofit sector share of enrollments nationwide rises to 29%. These private nonprofit sector "market share" figures were calculated by the author with the help of Penelope Karovsky from the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS) data base, appropriately scrubbed to delete for-profit and subcollegiate institutions.

[5] Nationwide, WICHE projects growth in high-school graduates between 1991-92 and 2001-02 of 19%, increasing to 34% by 2007-08 [58].

[6] There are signs that the weak job market created by the recent recession reduced returns on investment for college graduates slightly [36], but there is good reason to believe that this is a short-run blip in a long-term upward trend in returns to investment in higher education [30].

[7] For example, California, Florida, Virginia, and Washington all face strong pressures to expand their already full public higher education systems to accommodate huge increases in population [67]. Washington also seeks to increase its below average participation rate in upper-division and graduate education. Another large state, Pennsylvania, anticipates only modest increases in high-school graduates but has made increasing participation in higher education a major priority and therefore is greatly concerned about capacity constraints in its public sector. These cases are only illustrative, but they show that capacity constraints in the public higher education sector are not a problem limited to small states or the "Sunbelt."

[8] The states are listed in the table in order of largest negative to largest positive change in private sector enrollment, 1980-1990, to highlight those with the most apparent slack capacity in this sector. The point is reinforced by recent (1993) survey data collected by the author directly from state representatives of private nonprofit colleges (state association executives). When asked about the number of additional students their institutions could enroll without major additional investment, respondents from 33 states indicated a mean figure of nearly 7,800 (median = 5,000) additional students, or an average of 13% above fall 1990 enrollments in these states' independent sectors. When asked how many students their institutions would be interested in enrolling, assuming adequate quality students and government-funded student aid were available, respondents from 31 states indicated a mean of about 9,500 additional students or about 21% above fall 1990 sector enrollment levels on average [60].

[9] The comparative cost advantage of the private sector may disappear if public institutions also have excess capacity. Even so, funding arrangements for public institutions may not fully reflect such cost-reducing possibilities because they are often tied more closely to average than to marginal costs.

[10] This is an annual survey, see [38].

[11] The annual NASSGP survey reports [38] show that this range is very similar from year to year.

[12] A similar, more recent survey by the author indicated that the number of states with such arrangements had increased to 25 by 1993 [60]. In general, the data from the more recent survey showed few changes from the 1988 results, although there was evidence of a slightly increased level of state involvement with private colleges and universities overall.

[13] An anonymous referee points out that there may be other reasons for state allocation decisions between public and private sector alternatives. This is no doubt true, but the fact that policymakers can take cost-effectiveness considerations into account among real alternatives is in itself significant, and it is not unreasonable to think that they often do so in an era of constrained resources.

[14] Private sector representatives responding to the ECS survey ranked this area of state policy second in importance to them behind only state student aid policies [62].

[15] A 1993 survey by Zumeta [60] shows very similar results on this point.

[16] As indicated earlier, these state rankings tend to change little from year to year.

[17] The assumption is that the level of tuition in public higher education is subject to substantial state influence, albeit often not to direct state control [25].

[18] For examples in other policy fields, see [15, 29, 49].

[19] The discussion that follows summarizes pertinent findings reported in [64] in addition to presenting some related new findings.

[20] $R = 0.43$ ($p < 0.01$). For those who may object to using the three-category public tuition level variable in a correlation analysis, the relationship can also be conveyed by comparing the mean of the high-tuition states, $199 per student, to the means of the moderate- ($109) and low-tuition ($75) states. The difference between the high- and moderate-tuition states' means is significant at the 95% confidence level. To be sure that the relationship between public tuition level and state student aid spending was not simply the product of the probable link between public tuition levels and state student aid to *public* sector students, a variable representing need-based state aid to *private* institution undergraduates (systematic data on *non*-need-based aid by sector do not exist) per private sector undergraduate enrollment in the state was regressed on the state's public higher education tuition level classification. A significant positive relationship was found ($r = 0.32$, $p < 0.05$), indicating that state policies toward public tuition and student aid funding for students in *private* institutions are indeed associated.

[21] A chi-square test showed a relationship between public tuition level and presence of direct funding significant at better than the 0.05 level, but the relationship between public tuition level and private sector involvement in state planning did not reach customary levels of statistical significance.

[22] However, the final state policy variable — exclusion/inclusion of duplication of private institutions' programs as a criterion in reviews of new program proposals from public institutions — was found to be essentially unrelated to public higher education tuition level.

[23] Moreover, although the differences are not large enough to reach statistical significance, states with programs providing funds directly to private colleges and universities also tend to report more extensive private sector involvement in state higher education planning than do states without such programs; similarly, states with such programs are more likely than states without them to use duplication of private sector programs as a criterion in state reviews of new public college programs (76% versus 58%).

[24] For the roots of the latter two constructs, see [8, 46].

[25] I will later develop the argument that such spending may in fact be qualitatively different in that it seems to offset other forms of higher education spending.

[26] Whether or not this is always true is another question [48].

[27] For example, nonsectarian and Roman Catholic institutions in general tend to be less standoffish toward involvement with the state than are conservative Protestant ones.

[28] Of course, many "in-between" configurations and even wholly different postures are also logically possible, not to mention ad hoc, inconsistent patterns of policymaking that do not fit the idea of a policy "posture" at all. Empirical results relevant to this issue are reported in the next section.

[29] Involvement of private sector representatives in state planning processes (state board membership, involvement in issue task forces, etc.) would be expected to make such developments more likely.

[30] For a fuller description see [46]. Several states have recently initiated on a limited basis "performance contracting" or incentive arrangements with their public institutions that resemble these ideas. See [21, 42].

[31] On the theory of desirable redundancy in public policy, however, see [2, 24]. Also, in higher education programs with similar names may have different foci and serve different types of students.

[32] Recent federal legislation, including the 1992 reauthorization of the Higher Education Act, has emphasized increased quantity and quality of consumer information to include data on student and institutional performance. States have a key role in enforcing this new policy thrust [17].

[33] For purposes of the cluster analysis, student aid effort was converted to a categorical variable (like the other policy variables) by dividing the distribution of states on this variable at a natural break point in the data, in this case just below the 48-state median value.

[34] Compared to the four-cluster analysis, in the three-cluster version clusters one and two are combined, and the distinction between cluster three and the Florida-only cluster four survives, while in the five-cluster version cluster three is subdivided to create the fifth cluster.

[35] Note that the column at the right under each policy cluster shows each state's positioning in the initial hierarchical cluster analysis.

[36] For this analysis five regions were defined as follows: *Northeast* — Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont (District of Columbia and Maine were excluded for reasons indicated earlier); *Midwest* — Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin; *South* — Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, West Virginia; *Plains* — Kansas, Nebraska, North Dakota, Oklahoma, South Dakota; *West* — Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington. (Wyoming was excluded as indicated above.)

[37] If the states in the central-planning/market-competitive hybrid cluster are also considered to be central-planning-oriented states, this adds four more Northeastern states, five Midwestern states and five from the South, but no Plains or Western states.

[38] The central-planning/market-competitive hybrid cluster includes states with three of the four central-planning policies in place and at least four of the six market-competitive policies.

[39] As a referee suggested, the relationship might be even stronger if it were possible to identify accurately original state-residency of students in order to take account of the impact of out-of-state residents on enrollments (in both private and public sectors). However, the data to do this were not available. Also, it should be noted that there is

probably mutual causation at work in the relationship between private enrollment share and public policies. Private enrollment share may affect state policies and, in turn, policies would be expected to affect this sector's share of students. Time series data not now available would be required to adequately model the relationships causally.

[40] The difference between the means falls just short of significance at the 0.05 level.

[41] The difference between the first two group means is significant at the 0.05, level, and that between the latter two is significant at the 0.10 level.

[42] Among the 46 states for which ECS survey data on private sector involvement in state higher education planning were available there was a perfect downward progression in terms of both mean and median private market share from the states reporting extensive private sector involvement (mean private share of 25.7%, median of 24.3%) down to the three states reporting no involvement (mean private share of 7.3%, median 10.5%).

[43] To be precise, the data are association-reported budgets for 1988 or for the latest available year at the time of the ECS survey.

[44] Not all these relationships are statistically significant, however. See [64]for details.

[45] For earlier research supporting this view, see [32].

[46] Although the difference is not large enough to reach statistical significance, the 21 states with such programs averaged about $1,000 more in personal income per capita (at both the mean and median) than the states without them.

[47] On average, the states without such programs devoted 18.5% of their personal income to activities of state and local government (including higher education), compared to 15.5% for those with such programs ($p < 0.05$). The sign on the correlation coefficient between state tax effort and student aid grant spending is also negative but is not near statistical significance.

[48] This statement applies most clearly to state spending on student aid and on programs that provide state funds to independent institutions for other purposes. But tuition policies are another matter. Interestingly, the low-public-tuition states also tend to be low-wealth and high-tax-effort states, which suggests the possibility of their increasing public college tuition as a device for at once aiding the private sector and enhancing state (or public institution) revenue for expansion. Absent increased funding for student aid, however, such a step might impede access to higher education significantly in a low-wealth state. Recently, serious discussion of "high tuition/high aid" strategies for financing higher education has resumed [33, 57, 65] after years of little interest.

[49] This relative cost-effectiveness argument is of course less strong in states with slack capacity in their existing public institutions or little imminent increase in enrollment demand.

[50] Local expenditures are included because in many states local tax funds pay for a substantial share of the costs of public community colleges.

[51] The sign on the relationship between state spending on student aid grants and total state/local spending on higher education is also negative but not close to statistical significance. The weakness of this relationship may be the result of the fact that the student aid spending variable includes substantial (and highly variable from state to state) spending on aid to public college students and is thus an imperfect indicator of policy benefiting the private sector.

[52] To see if the modest positive relationship between private market share and presence of state direct payments to independent institutions might be distorting the apparent relationship between the latter and total per capita public spending on higher education, the latter variable was regressed on private market share separately for the states with direct payments to independent institutions and those without such programs. In both analyses the coefficient on private market share was negative and significant. The coefficients were well within one standard deviation of each other, implying that the inverse relationship between the presence of direct state payments to private institutions and total state higher education spending is bona fide.

[53] The national (48-state) figure for these expenditures in 1987-88 was $262 per capita (median = $259).

[54] A population of about 250 million divided by 50 states yields 5 million people per state.

[55] Twelve explanatory variables were employed in this analysis. Of these only two, state tax effort and private sector enrollment share, showed a significant relationship to the dependent variable when all variables were included. The other variables included in the analysis were state wealth, estimated state population growth 1980-88, student aid grants per undergraduate, absence/presence of programs providing direct state funds to private institutions, two dummy variables for state governance arrangements for higher education (coordinating board and governing board, the base case being some other form of statewide governance), and four dummy variables for region of the country (Northeast, Midwest, South and West, the base case being the Plains region).

[56] The F-value for the equation is 4.68 ($p < 0.0001$), with 38 degrees of freedom.

[57] The same cannot be said of the state student aid effort variable but, as was pointed out earlier, this measure is an imperfect indicator of policies favorable to the private sector because the share of these funds received by students attending private institutions varies widely from state to state.

[58] For related arguments and evidence in relation to education and higher education, see [22, 48, 50].

[59] The less common and hybrid forms seem to have little discernible relationship to state policies affecting private higher education [64].

[60] When only the 38 states employing one of the two dominant governance forms were compared, controlling for private market share, the regression coefficient showed higher education spending to be lower by $38 per capita in the regulatory coordinating board states (+ or − $18, $p < 0.10$). When all 51 states were examined using an additional dummy variable representing any other governance structure form (base case), the coordinating board states were found to be lower in per capita spending than the base states by $40 (+ or − $18, $p < 0.05$). The sign on the governing board variable was positive as expected, but their spending level was not significantly higher than that of the base states.

[61] These analyses were limited to 47 states because Wyoming has no private colleges, some of the necessary data were not available for Maine and the District of Columbia, and Alaska has values on many of the state characteristics variables, e.g., state wealth and tax effort, that are extreme outliers.

[62] Refer to Table 8 for a list of the states in each policy cluster.

[63] Among the four states in this policy cluster, the proportion of higher education enrollments in private nonprofit institutions is around 15% in Delaware, Kentucky, and Nebraska and above 40% in Vermont. Figure 1 indicates that 3 of the 4 states in this cluster anticipate growth in high-school graduates over the decade shown of more than 20%, while Kentucky expects about 11%.

[64] For a complete report of the discriminant analysis results, see [61].

[65] In one version of the analysis, dummy variables for region were added. These results were generally little different from those reported here.

[66] The periods used for state population growth and private sector enrollment growth do not coincide, because comparable data for the same time periods were not available at the time of the analysis.

[67] These functions were successfully estimated in that a discriminant function drawn from the above variables successfully classified a large majority of the states into one of the two initial groupings in each case, and the F-value for the function was statistically significant at the 0.05 level or better.

[68] In particular, the laissez-faire states had significantly smaller private sector shares of enrollment and were significantly more likely to have the consolidated governing board form of governance, consistent with expectations and with the bivariate relationships.

[69] Among the other state-level variables, only higher state wealth showed a nontrivial link to a state's classification in the central-planning cluster rather than the market-competitive + central-planning/market-competitive hybrid "supercluster," but the correlation fell well short of significance.

[70] In addition, three other variables showed F-values that were nontrivial but still well below the level required to enter the discriminant function. These were: private market share and overall participation in higher education, which tended to be higher in the pure market-competitive states; and private enrollment growth, which tended to be higher in the hybrid states.

[71] Higher public institution tuition should ideally be combined with a substantial increase in need-based aid to preserve access for lower-income students. Under such an arrangement, the state (or public institutions) should still realize net gains in revenue from higher tuition payments from non-needy, upper-income students, while private institutions should gain some competitive advantage in competing for both needy and non-needy students and thereby relieve the state of some of the burdens of financing enrollment growth in public institutions.

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Invisible Scholars

Students with Learning Disabilities

Increasing numbers of students with learning disabilities enroll in college (Hartman & Krulwich, 1984; Milne, 1989; Satcher, 1992; Shea, 1994; Wilczenski & Gillespie-Silver, 1992). Students with learning disabilities have been found to have essentially the same motives for obtaining a college degree as their nondisabled peers: to obtain further education or training, to learn a particular skill, to go to college because everybody else goes, to go because a family member wants them to go, to earn a degree, or to fulfill a desire for future meaningful employment (Faland & Haulbich, 1981; Harrison, 1982; Milne, 1989).

The term "learning disabled" describes a heterogeneous group of individuals who are unable to learn specific academic skills often despite having normal or above normal intelligence. Section 504 of the Rehabilitation Act of 1973 defined learning disabilities to be a handicapping condition that must be accommodated by federally funded institutions of higher education (Vogel, 1982). Additionally, colleges that recruit and admit students, including students with learning disabilities, have a moral obligation to provide academic support resources necessary for those students to succeed (Mangrum & Strichart, 1984; Satcher, 1992; Stage & Manning, 1992). Some guidance exists for college officials who seek to inform themselves of the needs of students with learning disabilities (Aune & Johnson, 1992; Brinckerhoff, Shaw, & McGuire, 1992; Mellard & Hazel, 1992; Satcher, 1992; Scott, 1994). However, more information is needed.

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In the academic arena, adults with learning disabilities reported having significant problems with reading, spelling, arithmetic, written composition, and handwriting (Hoffman, Sheldon, Minskoff, Sautter, Steidle, Baker, Bailey & Echols, 1987; Milne, 1989). Research on college students with learning disabilities is limited. Some case studies focus on the idiosyncratic experiences and needs of one individual (Ganschow, 1984; Meyers, 1985; Rawson, 1982). Nevertheless, a growing literature suggests that these students share some common traits (Hughes & Suritsky, 1994; Shafrir & Siegel, 1994; Zawaiza & Gerber, 1993). For example, negative attitudes and perceptions are apparent in college students with learning disabilities as well as their faculty and fellow students (Houck, Asselin, Troutman, & Arrington, 1992; Milne, 1989; Silverman & Zigmond, 1983). Such negative attitudes and perceptions could possibly interfere with the college experience of these students. The purpose of this study was to explore the experiences of college students with learning disabilities. The results of this investigation add to the slowly accumulating literature regarding the affective and behavioral characteristics of adults with learning disabilities.

Learning Disability

The definition of learning disabilities has been discussed extensively in the literature (see Kavale, Forness & Lorsbach, 1991; or Swanson, 1991 for overviews). In general, these discussions seek operational definitions that might be used for diagnosis. However, for general informational discussion, many authors (Hammill, 1986; 1990; Milne, 1989; Silver, 1988; Swanson, 1991) continue to employ the definition first adopted by the National Joint Committee for Learning Disabilities in 1981:

> Learning disabilities is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to central nervous system disfunction. Even though a learning disability may occur concomitantly with other handicapping conditions (e.g., sensory impairment, mental retardation, social and emotional disturbances) or environmental influences (e.g., cultural differences, insufficient/ inappropriate instruction, psychogenic factors), it is not the direct result of those conditions or influences (National Joint Committee on Learning Disabilities, 1987, p. 107).

A learning disability is often hidden. The casual observer may not realize that difficulty in processing information can cause a person to cope differently from others in learning and living situations. An individual who thinks logically and clearly may be physically unable to write a simple paragraph. In fact, one of the characteristics of individuals with learning disabilities is inconsistency of performance. The nature of the disability is such that it is likely to become apparent in academic settings. The impact increases as more demands are placed on these skills. Yet, because many adults with learning disabilities have normal or above normal intelligence, many of them devise extraordinary coping mechanisms to hide or overcome the disability (Hartman & Krulwich, 1984).

The regulations clarifying Section 504 of the Rehabilitation Act of 1973 were issued in 1977. Section 504 prohibits recipients of federal funds from discriminating because of disabilities. The 19 January 1981 regulations to implement the Rehabilitation Act of 1973, as amended, included within the definition those individuals with learning disabilities. Individualized programs to improve the ability of a student with a learning disability to learn have been available in elementary and secondary schools for two decades. In the early eighties an estimated 720,000 college students were learning disabled (Cohen, 1984). Increases in services provided by public schools meant expanding numbers of students with learning disabilities who entered college (Astin, Green, Korn, Schalit, & Berg, 1988; Shea, 1994; Wilczenski & Gillespie-Silver, 1992). Greater awareness and more sophisticated diagnostic techniques mean that these numbers continue to grow rapidly. Limited research is available to guide college officials and those specializing in the area of learning disabilities.

Most college courses rely heavily on verbal skills, (i.e., understanding lectures, reading textbooks and related literature, writing papers, participating in discussions, and making oral presentations). Unfortunately, professors are often unable and sometimes unwilling to recognize students with learning problems (Stage & Manning, 1992). Some faculty do not consider it their responsibility to modify curriculum and educational methods to accommodate students with learning disabilities. Others are not sure how to alter course materials and assignments and still maintain consistent standards of evaluation (Indiana University Office of Affirmative Action, 1995).

Unsurprisingly, measures of academic performance for students with learning disabilities who are admitted to college tend to be low. Additionally, students with learning disabilities perform less well in college than might be predicted by their high-school performance (Wilczenski & Gillespie-Silver, 1992). McGuire, Hall, and Litt (1991) and Brinckerhoff, Shaw, and McGuire (1992) described the specific support service needs of college students with learning disabilities. In addition to such information, assessment devices that provide reliable and valid information about the college student with a learning disability in relation to their various environments are needed.

Providing effective programs for students who have learning disabilities requires cooperative endeavors among students, peers, tutors, and faculty. Such efforts demand mutual understanding and supporting attitudes (Aune & Johnson, 1992). Additionally, extraordinary means might be necessary to overcome negative attitudes and perceptions on the part of peers and faculty as well as students with learning disabilities (Morris, Leuenberger & Aksamit, 1987).

Although much research evidence is based on studies of younger, precollege students, many authors have pointed out that attitudinal barriers and organizational structures within universities may impede the attainment of handicapped students' educational goals (Brinckerhoff, Shaw, & Mcguire, 1992; Hawthorne, 1977; Walker, 1980). Such restrictions possibly flourish because educators have limited opportunities to learn about the educational implications of specific learning disabilities. "Widespread faculty and administrative support cannot be expected to develop in an environment of misconceptions and negative attitudes about learning disabilities" (Vogel, 1982, p. 519).

This study explored experiences of college students with learning disabilities as well as the ways in which they adjusted to college. The literature suggested that the degree of match, or fit, between student and institution led to increased student satisfaction and academic achievement (Williams, 1987). Exploring how students with learning disabilities perceived the university and their relationship to it has potential for contributing to the understanding of satisfaction and adjustment to college. Many studies have found that individual characteristics, such as family background, relate to college success, persistence, and departure rates (Pascarella & Terenzini, 1991). Administrators and faculty might find it useful to understand the factors that influence success and satisfaction of college for students with learning disabilities in order to enhance their learning experiences on campus.

Research Methods

In order to describe students' attitudes, perceptions, and experiences, naturalistic inquiry methods were selected. These methods allow the researcher to engage in such description (Stage, 1992) and provide insider perspectives within the context of their natural setting (Whitt, 1991). The ethnographic interview, in particular, allows the researcher "to discover the meaning that people construct from involvement in a community" (Manning, 1992, p. 91). Wolcott (1988) describes ethnography as "literally, a picture of the 'way of life' of some identifiable group of people" (p. 188). Ethnographic techniques allowed us to learn from individual students' interpretations of their educational experiences and therefore were chosen for this study. Semistructured interviews were used to collect descriptive data regarding the experiences of college students with learning disabilities. Sources of data for this study included respondents as well as documents and records.

The research was conducted at a large state-supported research university in the Midwest. Eight undergraduate students with learning disabilities were selected by the director of Disabled Student Services and Veteran Affairs. Criteria used by the director in consultation with the researchers included choosing students with a range of learning disabilities who were at various points in their academic career and used the services provided by the disabled student services office. The sample included not only students with positive views about their learning disabilities and the support services in the school but also students who felt negative about their experiences.

To supplement the information provided by the students, three other informants were included in the study. The director of Disabled Students Services and Veteran Affairs provided a historical perspective on the services and specific information regarding the interviewees. In addition, a tutor recommended as exemplary by the director as well as by one of the students was interviewed. Finally, a professor named by the director was included because of his positive attitude and interaction with the office over time. Institutional documents including each student's class schedule, course grades, and psychoeducational assessments were examined. The psychologist responsible for the testing and assessment of students thought to have a learning disability at the university interpreted assessment records for this study.

Data Collection and Analysis

Data collection and data analysis occurred simultaneously. In other words, existing data informed collection and interpretation of additional data. Interviews began at the start of the academic year. Topics and questions were developed to guide the direction of the initial interview. Questions were open-ended and helped determine areas to be discussed in the second interview, but students tended to dominate the conversation with their concerns and issues and required little prompting from the interviewer. Not all respondents were asked all questions on the interview guide, and other questions not included on the guide were raised as the conversation indicated.[1]

Topics explored with the students included: (a) a general description of the students' college experiences; (b) students' experiences with faculty, peers, and tutors; (c) student's comparison of himself or herself to others; and (d) strategies the student employed in his or her studies. Probing was used to solicit greater depths of information.

Each of the eight key respondents (the college students with learning disabilities) was interviewed twice, totaling two to two and one half hours. The first interview occurred in the fall semester; the second interview took place at the start of the spring term. Interviews were conducted in a private location and tape-recorded. Respondents signed a consent form granting the researcher permission to use direct quotations and giving the respondents an opportunity to review the findings before the final conclusions were drafted. Notes were reviewed and expanded upon immediately after the interview and tapes were transcribed.

Key informants (the director of Disabled Student Services and Veteran Affairs, a tutor, and a faculty member) were interviewed one time. Additionally, information was sought regarding the institutional context in which these students with learning disabilities were required to perform. These interviews served to provide comparisons of and insights into information provided by key respondents.

Analysis of transcribed data included the initial process of unitizing phrases, sentences, or paragraphs that contained a complete thought. Units were then sorted into general categories according to themes identified from the basic units. Sorting occurred on an ongoing basis beginning with the unitization of the first transcript. Eventually data were grouped into primarily descriptive categories. Some units of data were placed in more than one category. Developing and refining categories continued until units of data were incorporated under a topic. Finally, each of these categories was grouped under a general theme that was used to report the data (Bogdan & Taylor, 1975; Guba & Lincoln, 1981).

Trustworthiness

Several techniques were employed to ensure trustworthiness (Lincoln & Guba, 1985; Whitt, 1991). A peer debriefer read notes and discussed classifications. Member checking[2] was employed to validate data, analytical categories, interpretations, and conclusions (Miles & Huberman, 1984). Detailed description was provided to enable the reader to determine how much of the results were relevant to their own campus situation. Additionally, the researchers provided as much background context as possible to facilitate the reader's understanding, yet maintain confidentiality. Finally, an audit trail was maintained throughout the course of the study as a method of establishing dependability and confirmability. The audit trail consisted of the raw data, products of data analysis, data reconstruction, and a journal.

The Respondents

The eight students who responded to this study represented a variety of learning disabilities, majors, and institutional ages within a research university. Half the students were male and half female. They ranged in age from 19 to 30, all but one student were full-time students, the part-time student was an undecided major. The sample consisted of two social work majors, a psychology major, a math major, a music major, a merchandise management major, and an advertising marketing major. Grade point averages (GPAs) ranged from 2.26 up to 3.64. Three of the students had only one diagnosed disability, one with reading and two with dyslexia. Two students had both language and math disabilities, two students had both dyslexia and math disabilities, and one student had both reading and math disabilities.

Results

Themes resulting from the study were divided into three major focuses: (1) dispositional factors affecting their college experiences, (2) institutional factors affecting their college experiences, and (3) coping strategies for study at the university.

Dispositional Factors

Dispositional factors included attitudinal or behavioral characteristics of the students that affected their experiences in college. The most important attitudinal factor was the individual student's self-perception. Each of the students in this study reported negative feelings of self-consciousness. As a result they were reluctant to let others know of their disabilities.

> At the weekly chapter meeting I have to explain that the reason I have to leave early is because I have to go meet my tutor because I have a learning disability. It is kind of embarrassing, but it is not that big of a deal (Pat).[3]
>
> I still walk under a dark cloud. I still am a little touchy on the subject of being learning disabled. And you know when you have to deal with any of your peers that you are not as good as they are, you're a little hesitant (Blake).

Some students attributed this self-consciousness to years of believing that they were not trying hard enough. They had been told that they were using their disability as an excuse and had received negative reactions from others. Those reactions sometimes caused them to wonder whether their disability was 'real.'

> I think sometimes I let my learning disability control too much. I don't understand something, so I blame it on my learning disability. . . . I've leaned on my learning disability so much as a youth that it is a crutch and when I get stuck I blame it on the learning disability. I'll get tense, I'll start thinking about the learning disability and the problems and how everything is just not working out (Blake).
>
> They'd tell me I could be excused from courses that were going to be too hard; that didn't make me feel real great (Kyle).

As a result of these attitudes or dispositions, students modified their behaviors in academic settings in ways that might have thwarted their academic progress. Often they did not participate fully in classroom activities.

> It will be a cool day in hell when I raise my hand, because that's just a fear of mine, of being wrong (Terry).
>
> I don't open my mouth too much in class cause there is a chance of getting embarrassed. I did that one time, I got confused, I said the wrong thing and I was misinterpreted. I knew what I wanted to say, but I said it wrong (Chris).
>
> This group project I was a part of, was not a great experience. We each had to write out things on the board and I refused to do that. I normally don't do that, but I just could not risk misspelling in front of the class (Kelly).

Some students, however, were able to use participation in class to their advantage; they had modified their behavior in some classes to compensate for their disabilities.

> In other classes that's how I learn best. If I have a question I raise my hand. That's my personality a lot, too (Jessie).
>
> I'm a verbal person. You want them to know you, and you want them to know that you're a good student, so you almost overcompensate (Kelly).

Motivation played a key role in the lives of all the interviewees. An internal impetus to succeed at college work was a prime factor in their university experience. Unanimously they took responsibility for their college status and attributed their drive and ambition to a number of factors.

> Last semester I was at the library every day because I was sick of getting bad grades, sick of the teachers not understanding. I got a 3.0 GPA. I know I can do it (Terry).
>
> My most satisfying, I think, was probably pulling almost an "A" out of that 138 class, cause that showed me I knew I could do it (Chris).

> A satisfying experience for me has been basically making it. . . . I've done it by myself (Terry).

The students seemed uniquely able to recognize their own accomplishments, no matter how small, and to reward themselves by cherishing such achievements. Undoubtedly, this was an important factor in maintaining their high levels of motivation.

Institutional Factors

Institutional factors included aspects of the university that helped or hindered students' progress toward their goals. Students mentioned faculty, tutors, and peers as important elements in their college experiences.

Interactions with faculty seemed to cover the broadest range for the students interviewed. For some students, an experience with a faculty member was among the most positive of their university experiences; for others it was among the most negative. Fortunately, each student was able to recount positive instances of helpfulness, concern, and accommodation for their learning disabilities.

> Usually, with my professors the response is "really, I would have never guessed?" and then they have me talk about learning disabilities (Jessie).

> Last year I had a class with 350 plus students. . . . Well I had to constantly keep up with him. . . . That was a nice bonus, to be able to communicate with the professor and have him know who you are. Now I see him all over campus and he talks to me. With most professors, it's been that way (Blake).

However, not all faculty were sensitive to the needs of students with learning disabilities. Some faculty and associate instructors were unwilling to allow extra time for examinations and papers, even when the student had requested such arrangements at the beginning of the semester.

> I told the professor that I was dyslexic and she said, "Well, we can't really do anything about that. You're going to have to take the test just like everybody else." I explained that I was asking for more time and she said, "Well, I don't know if we can give you more time" (Chris).

> I thought I'd do it orally on a tape recorder and hand him the tape recorder as my paper. Well, he said, "It better not be more than four minutes long. Papers are supposed to be three to four pages." Okay, so honestly, it was like 6½ minutes and he took points off for that (Terry).

Each of the students had met cooperation and understanding by some of their faculty members. The advantage of a one-to-one interaction between student and faculty member was an important factor in a student's success for that class. Obviously, the university's large class sizes often interfered with those relationships. Sometimes tutors were able to fill an important personal role in students' academic lives.

> I had this tutor who was a grad student and she knew what I was capable of and when I was being lazy she would be like, "come on, just go home, I don't really want to work with you, you are just being lazy. . . ." She was strict, like when I had a paper due tomorrow, she would say "why did you procrastinate so long?" That's what I need (Terry).

Most often however, tutors were mentioned in a negative light. The university merely provided the students with lists of students' names who were willing to tutor. These prospective tutors were academically talented students who wished to earn money and who often had no knowledge of teaching techniques nor of learning disabilities. Additionally, they were provided no special training or guidance by the university or Disabled Student Services.

> They just give you a list and say, "Here, you pick them out yourself." It's hard to find out who I'm going to need. They have no screening program for anybody. . . . I have been to the Education building, picking up tutors' names off the bulletin board and it's just people who are looking for an extra penny (Terry).

> I really like to stick to what I say I'm going to do. . . . So when tutors don't come through and I'm depending on them, that's a real problem (Alex).

In addition to problems with tutors, most students reported having difficulty paying for the tutoring. The Disabled Student Services office paid $4.50 per hour, but some tutors charged up to $10 per hour. The respondents paid the difference out of their own pockets, and that sometimes created financial hardships.

Students' relationships with peers vis-à-vis their learning disabilities covered a wide range. Behaviors varied on the part of the students with disabilities as well as on the part of their peers. Some students were very open about their disabilities and had a wide range of friends, others associated primarily with other students with disabilities. At least half the students were reluctant to share information with others.

> My girlfriend doesn't know (Blake).

> It never comes up (Alex).

> I don't do the whole disability scenario because it is just an excuse to me and I don't use it as an excuse (Terry).

Unfortunately, when the information was shared, some reactions on the parts of peers were not positive and ranged from skepticism to outright negative reactions.

> I'll tell them, "I swear to God, you guys, I'm totally dyslexic, I'm totally learning disabled." And they're like, "shut up, you are not, what do you mean?" (Blake).
>
> I'm still feeling out when I should share my disability because now my roommates seem to think that they have to explain everything to me (Alex).

One student was unable to convince a fellow student with a learning disability that she had the same problem.

> So this guy is like, "Oh, you would never understand my learning disability." And I'm like, "Yeah I would, I am too." And he's like, "You are not, shut up, you are not." . . . To this day he doesn't believe me (Terry).

Terry's experience was poignant in that it seemed appropriate and perhaps particularly useful that two friends with learning disabilities might share resources, work together, or simply commiserate. The young man however, seemed only able to interpret his friend's disclosure as an attempt to patronize.

In contrast, however, many reactions were positive and ranged from supportive curiosity or reassurance and understanding comments.

> There's a[nother] guy in the house who has a learning disability and he's just no big deal (Pat).
>
> Wow, I didn't know that you were dyslexic; wow that's pretty neat (Chris).

Interestingly enough, peers tended to assume that a student's long hours spent in the library indicated a high level of intelligence. Some of the students permitted their friends to continue with that impression.

Coping Strategies

The students described skill areas and specific subjects where their disabilities impacted their academic performance. Learning disabilities had a negative influence on reading, writing, organization of thoughts, and processing information. Mathematics, foreign language, and political science courses were repeatedly mentioned as particularly problematic for the students interviewed.

All the students had developed management techniques of various kinds to compensate for their disabilities. These behaviors often combined coping strategies. Tactics described ranged from various exercises to relieve stress to various types of study schemes to methods for handling their own feelings of inadequacy. Time was frequently mentioned as an enemy of the students who quickly learned that they did not have time to apply every study strategy to every class.

> So you just have to figure out how to use your time because if you do all the stuff to try to compensate, it is too much. You don't have time for that and you get frustrated (Kyle).

The most common strategy mentioned was putting in greater amounts of time than their peers on their coursework.

> When I see friends do better than me without putting in much time studying, I just want to shoot them! I really grew to resent my roommate who was carrying 17 credits and pulling As and Bs and still had time to play (Kelly).
>
> I work at least two more hours per class, if not more, depending on how much reading I have to do (Chris).

It seemed that over the course of their academic careers students had attempted a wide range of strategies for learning class material. More than other students perhaps, they had learned how they learned best. For some, possibly that meant never reading the text and concentrating on lectures. For others that meant never going to class and reading every book on the subject. Still others effectively combined the two approaches.

> I can't read textbooks very well. It frustrates me. It takes up too much of my time and then I end up realizing that half of what the professor wants isn't in the book anyway (Kyle).
>
> If it's a professor that wants book stuff, then I don't usually go to class and concentrate instead on reading the book. There was one class I took, where I went to class 5 times and I got an A–. I just read the book and 3 others that were like it, and got somebody's notes (Blake).

In general, the students with learning disabilities followed study approaches that would be useful to anyone in college. Such strategies seemed to be more central to their work habits than to those of the average college student. Strategies included underlining what the professor emphasized so that it could be highlighted in review; constantly reviewing material; making a daily routine of classes, studying, tutoring, and free time that worked well; blocking out time for certain assignments; spending time at the library in a "study" atmosphere; and setting goals such as short-term daily checklists as well as long-term career oriented goals. Some students relied on a tutor, while others relied on a friend or family member for help with particular subjects.

> I really rely on my memory and a lot of times I think I am cheating. Maybe I don't really know this information. Maybe I'm just memorizing it (Kelly).
>
> I'm doing everything, setting time aside, getting up in the morning and studying. But I just can't quite handle the subject matter by myself, I have to depend on someone else, like a tutor (Alex).
>
> I basically block out time on my calendar saying "paper" and that's when I work on it, so I am not doing it at the last minute (Pat).

> If someone else is reading aloud and I am following along, I get that really good. That's the ideal situation, hearing it and being able to see it at the same time. I see it, hear it, read it. Three ways rather than one, more reinforcement (Chris).

A strategy commonly suggested for students with learning disabilities is to make a tape-recording of the lecture for later review and note taking. However, as described by students in this study, the approach was not without its drawbacks.

> This semester I started taping one of my classes, so we'll see how that works out. You really do take in what the professor is saying if you aren't preoccupied with taking notes. . . . I'll set up a time before each class, maybe a day in advance to just listen to one and a half hours of tape. It is time consuming and I don't have a lot of time this semester, but that is what I have to do (Blake).

Once students had identified their best learning methods, shortcuts that worked could be implemented. In a positive sense, that meant students with learning disabilities knew what they had to do in order to get good grades. The downside was that they often had to forsake other learning opportunities — such as giving up going to the lecture in order to have more time to read — to allow enough time to devote to their best strategies.

Discussion

This research described the experiences of a small sample of undergraduate students at a large research university and holds limited generalizability. The major purpose of the study was to create awareness of the experiences of a particular segment of the college student population. It is likely that some students with learning disabilities have experiences unlike those described here. For example, students in this study were highly motivated and had a degree of success at the college level. Students with learning disabilities who had already dropped out of college were not included in this study. Nevertheless, the results of this study provided an opportunity to make observations and recommendations that may shed some light on the problems faced by college students with learning disabilities.

Interviews conducted with eight students with learning disabilities resulted in dispositional as well as institutional factors that affected their experiences. All students had developed a set or sets of coping strategies that helped them contend with various types of academic situations. Often those strategies were not unlike approaches that might be used by any good student intent on learning material for a course.

Many of the experiences the students described had to do with their views of themselves intellectually and academically. Similar to other literature on students with learning disabilities, many of those perceptions were negative, possibly based on years of uneven classroom success (Miller, McKinley, & Ryan, 1979). Additionally, students often encountered experiences that reinforced those negative self perceptions. Those negative opinions in turn, colored students' academic behaviors.

The students were often reluctant to participate in classroom experiences that might demonstrate their disability in front of an audience. Students had refused to answer questions, to read, to write on the board, or to participate in some kinds of group learning activities. In instances where students had not informed the instructor of their disability, it is possible that their grades had suffered. Additionally, because of the fear of participation, many of the students were unable to avail themselves of the full range of classroom learning opportunities, such as rendering an opinion, leading a class exercise, or taking notes and reporting to class from a group discussion.

A common trait of these students seemed to be a high level of motivation coupled with a realistic view of their own possibilities. Some of them had learned to take special pride in small accomplishments such as a high grade on a particular assignment even if they did not earn a high grade for the entire course.

Another aspect of students' disposition, frequent expressions of anger, resulted from students' interactions with faculty and peers. A primary source of irritation was due to misperceptions about them and their disability. Because their disabilities were invisible, faculty often were skeptical and resistant to students' requests for special accommodations. More than once, students expressed the frustration that if they were in a wheelchair or presented other visible disabilities, teachers would accommodate their needs more readily. In justice to the college professors in question, it is unlikely that many of them had training or extensive experience working with college students with learning disabilities. Determining how much latitude to give students in assignments probably falls beyond the scope of their comfortable experience. An option that seemed fair for a college student with a learning disability might seem unfair in relation to other students in the class. At the institution in question, such negotiations were left between instructor and student with little guidance.

Broad variations on strengths and weaknesses among students naturally resulted in a great variety of coping strategies. Some relied on verbal strengths to impress a professor before turning in written assignments. Others concentrated all effort on perfecting written assignments and were reluctant or had little time for personal contact with professors. Additionally, professors' singular teaching styles, variations in subject matter, differing class levels, and nature of class assignments combined to make unique demands on the students. Idiosyncratic demands of individual classes required modifications of individual student behavior. Strategies for learning were necessarily adjusted from class to class to ensure success.

Recommendations.

Clearly, more information is needed on college students with learning disabilities. We have no answers to simple questions such as, "what proportion of students on a given campus have learning disabilities?" Additionally, other, more complicated questions require answers. What criteria are used to assess learning disabilities? How much and what kinds of educational options for students with disabilities are fair to all students in a class? How might colleges and universities fairly provide equitable educational opportunities to students with learning disabilities whom they have knowingly recruited? Clearly, uniform and widely publicized means within and across universities for identifying students with disabilities are needed. These and other questions provide an open agenda for further research.

A tendency might be for programs for students with learning disabilities to focus attention and efforts on students themselves (McGuire, Hall, & Litt, 1991; Meyers, 1985). From students' narratives in the present study, it appears that efforts could be focused on others as well. These students find themselves functioning in an environment that affects them emotionally as well as academically. Students described negative reactions from faculty and peers. Such responses are most likely the result of lack of experience rather than maliciousness. However, the net result for a student who has self-esteem problems to start with could be devastating.

Some of the obstacles that students encountered centered around their relationships with faculty who seemed reluctant or uncertain about providing variation in tasks demanded of their students. Recent literature has described the need for variation of presentation of materials in and outside the classroom as well as variations in the ways in which students are allowed to express their accumulated knowledge. Sources describe such variations as advantageous to students of varying learning styles (Kolb, 1985; Russell & Rothschadl, 1991), women (Clinchy, 1989; Harding, 1992), ethnic minorities (Anderson, 1988; Stage & Manning, 1992), and students at varying levels of cognitive development (Knefelkamp, 1974). Clearly, variation and flexibility in ways of presenting information (e.g., videotapes, role play, debates) and expressive style (e.g., essays, group projects, oral tests) in academic learning would serve a broad population, not just students with learning disabilities.

The university in this study provided a letter certifying that a student had been diagnosed with a learning disability and offered to provide a testing situation for students who required more time. A faculty development or other university service office could provide information to faculty — educating them on what a learning disability is, how it is differentiated from intelligence, and supplying examples of the sorts of unevenness of performance presented by students with learning disabilities.

Some of the students' negative experiences occurred with reactions to them by insensitive peers. Perhaps it is unfortunate that during the 1970s and 80s students with a wide range of disabilities and behavioral problems were labeled as students with learning disabilities. As a result the term 'learning disability' is likely to hold negative connotations for other students. Some of the disbelief that peers expressed might have to do with a limited view that encompassed persons with extreme learning disabilities rather than those students commonly studying on today's college campus. Clearly, a program of education for all college students would be helpful.

The university could easily influence these students' experiences with tutors. Lists of tutors could, at the very least, be annotated to include information about length of experience working with college students with learning disabilities. A notebook or card file of students' evaluations of tutors might be useful. Finally, a workshop organized by the director of Disabled Student Services along with special education faculty or academic learning support personnel could be used to provide "certification" for tutors.

Those familiar with large college campuses would not be surprised to hear them described as cold and isolating. Compounded with that, students in this study had an invisible disability and were separated by lack of knowledge from peers who shared their disabilities and experiences. It is reasonable to expect that their institution might find ways to provide a network of mutual support for these students. Administrators could facilitate voluntary activities at little cost. Options range from mentoring of new students by more experienced ones, to facilitating the development of a support/awareness group, to creating a space or lounge for students to gather. Merely providing lists of tutors and minimum wage reimbursement for that expenditure strikes one as minimal in the face of the tuition and activity fees paid by these students. A support group would allow students to share information regarding faculty who might be willing to work with them and their disabilities. Additionally, it would provide a venue for a clearinghouse on campus tutors and other services that could possibly be useful to these students.

These students described a wide array of approaches to study and learning. Many programs offer students laundry lists of possible strategies, and in the words of Terry, "There just aren't that many hours in the day" to employ all of them. Help given to students might include not only a list of strategies, but also help in sorting out those strategies that might be useful for an individual student in a particular type of class responding to certain types of learning tasks.

Finally, given the range described by students in their manner of dealing with faculty, clearly they could use guidance in communication with faculty. Perhaps students could present their instructors with a list of their strengths as well as their weaknesses at the beginning of the semester. From that list a student might develop a discussion of possible performance alternatives together with the instructor rather than asking for a specific variance from a classroom activity. This cooperative approach might elicit a less defensive response from some faculty.

In a positive sense, the students with learning disabilities seemed to have a greater academic self-awareness than most of their peers. Those students who were interviewed in this study knew exactly what their strengths and weaknesses were and were able to capitalize on the former or compensate for the latter as the situation demanded. Many of their undergraduate peers who do not have learning disabilities might take a more "hit-or-miss" approach to study. These successful students with learning disabilities had a plan; they figured out what it was they needed to do — and they did it. Clearly, room exists within academe for this almost heroic resourcefulness and determination combined with intelligence. Additionally, these learning disabled students serve as examples for countless other college students.

Notes

[1] The interview guide and profiles of the students may be obtained from the authors.

[2] Member checking involves sending a summary of the interview or the actual results to respondents for validation (see Lincoln & Guba, 1986 and Miles & Huberman, 1984). In this case, a draft of the results was provided to the respondents for their approval.

[3] Pseudonyms were used in this article.

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Occupational Outcomes for Students Earning Two-Year College Degrees

Income, Status, and Equity

Introduction

An interesting question in the sociology of knowledge and the politics of scholarship is why scholars studying two-year colleges[1] often conceptualize their research in adversarial terms. Innocent readers, encountering the subject for the first time by studying such works as those by Cohen & Brawer [5] and Brint & Karabel [3] might well wonder if the two books really dealt with the same institutions. Regardless of the reasons for the divisiveness that characterizes the field, advocates and critics make it more difficult to design an investigation of the effects of two-year colleges that not only *is* nonpartisan but also gives the appearance of being nonpartisan. Our work is no exception.

The case for or against the two-year college is often predetermined by the aspect of the subject researchers choose to study. For example, do we examine *access* to higher education or *persistence* in higher education? If we study access, two-year colleges appear to have egalitarian effects; if we study persistence they seem to perpetuate inequality [16]. Many studies focus on persistence or educational attainment. The most

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often asked question is: are high-school graduates who begin their postsecondary studies in two-year schools as likely as those who enter four-year schools to get bachelors' degrees? Nearly all such studies have found that, even after controlling for several background variables, students aiming to earn bachelors' degrees are more likely to succeed if they begin their studies in a four-year college — between 11% and 19% more likely according to most estimates. This finding has been very extensively documented and explained by Dougherty [6, 7] and recently reconfirmed by Whitaker & Pascarella [25]. (See [15] for an important qualification.)

But focusing only on educational attainment reduces the concept of equality of opportunity to equality of *educational* opportunity. Educational opportunity usually matters in stratification research because education opens the way to other opportunities, especially for income and status. Hence it is important to investigate, not only the two-year colleges' effects on educational attainment (and thus their indirect effects on occupational attainment). It is also important to investigate two-year colleges' more direct influences on occupational attainment.

When studying occupational attainment as an outcome variable, the approach one takes to the subject again tends to prejudge matters in favor of either the advocates or the critics. The key issue is the proper comparison group. In research that compares individuals who began their postsecondary studies in two-year schools with those who began in four-year schools, the four-year attenders come out well ahead in job status, even after controlling for postsecondary educational attainment [18]. Critics point to this kind of evidence to maintain that two-year colleges perpetuate the existing occupational structure and students' places in it. Much research on the issue has, in fact, been done by critics and has compared the educational and occupational achievements of two-year and four-year college entrants. There has been little doubt that four-year college entrants tend to attain higher occupational status and earnings than two-year college entrants.

But that is not the only appropriate comparison. In this study we load the dice the other way. We compare occupational outcomes for two-year college students with the occupational outcomes of high school graduates who entered the labor market with no postsecondary education. This comparison has not been made very frequently, and the results are much less conclusive than the two-year versus four-year comparison. (See Dougherty's review [7, p. 66] of the scant literature.) Furthermore, we compare these high school graduates with "committed" two-year college students, that is, those who began their studies within eighteen months of graduating from high school and who attended long enough and regularly enough to earn a vocational certificate, an associate's degree, or who transferred to a four-year college and earned a bachelor's degree. This loads the dice still further, because previous research suggests that students who merely take courses in two-year colleges without earning degrees or certificates get few if any income benefits [9, 10, 11, 12; but compare 13]. By focusing on "serious" students who used the two-year college extensively we can gauge its maximum effects.[2] If even these students obtained no advantages, the critics' case would seem incontrovertible. On the other hand, if significant benefits accrued to community college students — who might otherwise have forgone postsecondary education altogether — conclusions about the effects of community colleges could be more nuanced than either supporters or critics usually claim. This is in fact what we propose to demonstrate.

We examined not only the general but also the conditional effects of attending community colleges so that we could investigate questions of equity. Our goal was to see whether on balance two-year college education reduced, increased, or left unchanged the occupational status and earnings *gaps* between some more and less advantaged groups in U.S. society, specifically: males and females, blacks and whites, low-SES and non-low-SES individuals.

Data and Methods

To study these questions we used what is arguably the best available data base: the National Longitudinal Study of the high-school graduating class of 1972. The base year data come from a national probability sample of over 20,000 seniors who attended some 1,300 high schools. This sample (NLS-72) was used for the background and high-school variables. We used the fifth follow up conducted in 1986 (NLS-86) for the outcome variables. The newly available "cleaned" data from the Postsecondary Education Transcript Sample (NLS/PETS) was used for the higher education variables. Because this latter source is based on examination of actual transcripts, it is superior to the sometimes inaccurate self-reports that have been used in the past to study educational attainment [1].

These three data bases allow us to estimate the occupational effects of different educational paths thirteen years after subjects graduated from high school, while controlling for many important precollege background variables, specifically: ethnicity, gender, parents' occupational status, parents' education level, students' high-school program, high-school grades, hours worked in high school, educational plans, and occupational aspirations. (See Appendix A for a complete list and the coding scheme.) Although any longitudinal study extending over a period of fourteen years will have sample attrition and related problems, many features of the NLS, such as a response rate of around 90%, inspire confidence. Besides, if we wish to study the questions raised in this article, we have no practical alternative [1, 4].

The Sample

The fifth follow-up survey of 1986 sought responses from 12,841 individuals (something over half of the original 1972 graduates). Response rates for all waves ranged from 88% to 90%. We excluded people who had no earnings for 1985 because that was one of our dependent variables. Also excluded were those who held no full-time job between 1979 and 1986, Because the status of that job was our other dependent variable. We also excluded some subjects (481) who had values for one, but not for both dependent variables. We did not exclude subjects with missing values for independent variables; rather we used mean substitution for those missing values.[3]

Our final sample contains 1,542 two-year college degree students and 2,167 high school graduates, making a total of 3,709. Table 1 presents some basic descriptive data comparing the two groups. The differences are not surprising. Successful two-year college students were about four times as likely (36.8% to 9.7%) to have high-SES parents and to have been in the academic track in high school (58.3% versus 13.2%). They were six times as likely to describe themselves as earning excellent grades (15.7% to 2.5%) and over seven times as likely to have parents who had graduated from college (11.3% versus 1.5%).*

Limitations

The NLS data set has certain advantages and disadvantages in comparison to the other data set often used to address these questions: the High School and Beyond (HSB) study of the graduating class of 1980. HSB tells us about the effects of postsecondary education in the early 1980s, whereas the NLS has the disadvantage of giving us information about a more remote period — the early 1970s. On the other hand, the HSB data have the disadvantage that insufficient time passed after the subjects completed their educations to allow the occupational effects of education to manifest themselves fully [17]. This tradeoff between long-term and recent studies is inevitable. He who says long-term effects, says old effects. Recent effects, by contrast, are necessarily short-term. Furthermore, studies like ours are always historical, in data if not by

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*Further descriptive information, including means, standard deviations, and a correlation matrix for all variables, can be obtained upon request from the authors.

TABLE 1
Basic Demographic Information on Sample by Postsecondary Paths

	Community College Degree Earners (1,542)	High-School Graduates (2,167)
Race/Ethnicity		
White	84.1%	78.7%
Non-white	15.9%	21.3%
Family SES Status		
Low	17.0%	42.5%
Medium	46.2%	47.8%
High	36.8%	9.7%
High-School Program		
General	28.7%	46.2%
Academic	58.3%	13.2%
Vocational-technical	13.0%	40.6%
High-School Grades		
Excellent	15.7%	2.5%
Good	29.7%	20.3%
Average	41.6%	46.3%
Poor	12.9%	30.9%
Parents' Education		
High School or less	61.1%	89.6%
Some college	22.1%	7.6%
Four-year college	11.3%	1.5%
Graduate school	5.5%	1.3%

SOURCE: U.S. Department of Education, NLS-72 Data.
NOTE: Total cases = 3,709. Percentages are not based on the total sample but on the two separate samples.

intent. We stress this (and write in the past tense) because it may help explain and qualify some of our findings. In any case, our results apply with certainty only to the influence of two-year college education in the early 1970s on annual income for 1985 and occupational status of the current or most recent job as of February 1986. Whether the present is or future will be like that particular past must await later studies. In sum, while the NLS data are arguably our best, one needs to exercise great caution in assuming that what was true of the effects of two-year college education in about 1975 on earnings in 1985 tells us what the effects of two-year college education will be in, say, the year 2010 for students graduating from high school next June.

Results

Our findings can be summarized as answers to two questions: (1) What occupational benefits, if any, does two-year college education provide to students who persist to a degree or certificate? and (2) What are the equity effects of two-year college education — that is, does it change the size of the gaps between more and less advantaged segments of the population?

Occupational Benefits

Contrary to the most harsh critics, students as a whole were not hurt by attending a two-year college — ***when compared to those individuals who had no higher education at all.*** For individuals who could not afford or who did not want to attend a four-year college, the two-year college provided access to jobs higher in earnings and/or status than did entering the labor market directly after high-school graduation. This was true after controlling for important background variables, and it was true, although in widely varying degrees, for *all* groups we studied.

Our results are detailed in the following tables.[4] Table 2 shows the general effects, for all subjects, of two-year college education on annual income in 1985. The bivariate relation (Model 1) shows that high-school students who graduated in 1972 and who entered community colleges and attained degrees or certificates earned in 1985 about $7,000 per year more than 1972 high-school graduates who ended their educations that year. After we controlled for our blocks of precollege variables (Model 5), that earnings advantage was reduced to about $2,000. These variables are the usual ones in stratification research and are generally among the better predictors of income. After controlling for all of them the earnings advantage of community college degree recipients was still quite substantial — enough, roughly, to cover a modest car payment in 1985, which we interpret as a serious if not major enhancement of life chances. A similar pattern emerged when the dependent variable was occupational status, measured by Duncan Socioeconomic Index (SEI) status points (Table 3). A bivariate advantage of about 18 points (Model 1) was reduced to 7 after all controls were entered into the equation (Model 5). It is also worthy of note that community college education predicted more of the variance in occupational status (about one-third, adjusted $R^2 = 0.34$) than in income (about one-quarter, adjusted $R^2 = 0.26$).

Some of that status predictability is surely an artifact of how the Duncan Socioeconomic Index (SEI) measures status. The SEI is a proxy measure of occupational prestige made up of two components: the incomes and educational levels of holders of occupations. In our case, therefore, by using the Duncan SEI as our measure of occupational prestige or status, we are in part measuring the influence of education level on education level; we are using education level to predict a score that is based partly on education level! This peculiar practice is

TABLE 2
OLS Regression, Earnings for All Respondents

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Education					
Community college					
Degree earners	$6850***	$6416***	$5058***	$3607***	$2003**
Demographic Variables					
Female	—	−$10026***	−$9810***	−$10471***	−$10353***
Non-white	—	−$1391**	$239	$578	$438
Parents' SES					
Middle	—	—	$2721***	$2515***	$2454***
High	—	—	$5996***	$5571***	$5479***
Parents' Education					
High school only	—	—	−$67	$43	$65
Some college	—	—	−$656	−$479	−$218
Four-year degree+	—	—	$4907***	$5369***	$5406***
Hours Worked in High School					
Zero	—	—	—	−$109	−$246
Some (4–6)	—	—	—	$744	$594
More (7+)	—	—	—	$445	$324
High-School Program					
Academic	—	—	—	$1384**	$1074
Technical	—	—	—	$158	*206
High-School Grades					
Excellent	—	—	—	$5649***	$5206***
Good	—	—	—	$4440***	$4291***
Average	—	—	—	2223***	*2186***
Educational Plans					
High school only	—	—	—	—	$1961
Technical	—	—	—	—	$835
Junior college	—	—	—	—	$1474
Four-year college	—	—	—	—	$3799*
Graduate school	—	—	—	—	$5816**
Occupational Plans					
Planned job status	—	—	—	—	−$31
Intercept	$17,010***	$22,276***	$15,797***	12,264***	$11,942***
Adj. *R*-square	0.07	0.22	0.24	0.25	0.26

NOTE: Number of cases = 3,709 and "—" denoting that variable is not entered in the model.
$^*p < 0.05$. $^{**}p < 0.01$. $^{***}p < 0.001$.

quite widespread and usually passes without mention. It is justified mainly by the fact that we have no better measure of occupational prestige than Duncan's and that the artifactual problems often make no substantive differences in results [8]. Also the Duncan measure is the most commonly used index of occupational prestige in national data sets. This makes it possible for us to compare our results to those reported in a wide range of studies [e.g., 7, 18, 25].

TABLE 3

OLS Regression, Occupational Status for All Respondents

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Education					
Community college					
Degree earners	17.8***	17.8***	15.2***	10.1***	7.0**
Demographic Variables					
Female	—	5.0***	5.0***	2.5***	2.6***
Non-white	—	−3.5**	−1.2	−0.5	−1.0
Parents' SES					
Middle	—	—	2.5***	1.9**	1.7**
High	—	—	5.4***	4.0***	3.6***
Parents' Education					
High school only	—	—	−1.6*	−1.2	−1.1
Some college	—	—	−1.7	−1.0	−0.7
Four-year degree+	—	—	5.6***	3.4*	2.8
Hours Worked in High School					
Zero	—	—	—	1.6*	1.5**
Some (4-6)	—	—	—	−0.7	−0.6
More (7+)	—	—	—	0.1	0.2
High-School Program					
Academic	—	—	—	5.6***	4.5***
Technical	—	—	—	0.8	1.0
High-School Grades					
Excellent	—	—	—	16.7***	15.0***
Good	—	—	—	10.1***	9.5***
Average	—	—	—	3.8***	3.8***
Educational Plans					
High school only	—	—	—	—	6.8**
Technical	—	—	—	—	6.4**
Junior college	—	—	—	—	5.6*
Four-year college	—	—	—	—	9.5***
Graduate school	—	—	—	—	15.1***
Occupational Plans					
Planned job status	—	—	—	—	−0.1***
Intercept	32.8***	30.9***	37.5***	28.9***	18.9***
Adj. *R*-square	0.21	0.23	0.26	0.33	0.34

NOTE: Number of cases = 3,709 and "—" denoting that variable was not entered in the model.
$^{*}p < 0.05$. $^{**}p < 0.01$. $^{***}p < 0.001$.

Of our 1,542 degree earners who began their educations in two-year colleges, 976 eventually transferred to four-year schools and earned baccalaureates. The remaining 566 ended their educations with degrees or certificates from two-year schools. The occupational outcomes for those two groups of degree earners are reported in Tables 4 and 5, which reproduce the full model with all of our precollege variables controlled.[5] In Table 4 we compare high-school graduates' earnings and

TABLE 4
OLS Regression, Earnings and Status for Holders of Sub-baccalaureates

Independent Variables	Dependent Variables	
	Earnings	Status
Education		
Sub-baccalaureate	\$4,130***	8.4***
Demographic Variables		
Female	−\$10,193***	4.1***
Non-white	\$174	−0.9
Parents' SES		
Middle	\$2,454	2.3***
High	\$6,018	4.7***
Parents' Education		
High school only	−\$279	−0.8
Some college	\$2,669**	−0.1
Four-year degree+	\$1,420	−3.3
Hours Worked in High School		
Zero	\$76	1.9**
Some (4–6)	\$633	0.5
More (7+)	\$391	1.0
High-School Program		
Academic	\$955	5.0***
Technical	\$14	1.0
High-School Grades		
Excellent	\$5,535***	13.1***
Good	\$3,939***	8.9***
Average	\$2,734***	4.1***
Educational Plans		
High school only	\$2,036	7.4***
Technical	\$1,104	7.0**
Junior college	\$1,696	4.5
Four-year college	\$3,578*	11.4***
Graduate school	\$6,831**	15.3***
Occupational Plans	−56**	0.1*
Planned job status	−\$54	0.1
Intercept	\$13,707***	17.3***
Adj. R-square	0.29	0.30

NOTE: Number of cases = 2,732
$^{*}p < 0.05$. $^{**}p < 0.01$. $^{***}p < 0.001$.

job status to *sub*-baccalaureates, and in Table 5 we compare high-school graduates to *transfer* baccalaureates. In what is perhaps our most intriguing result, holders of sub-baccalaureates earned more and gained more status points (compared to high-school graduates) than did the transfer baccalaureates: about \$2,300 in income and around 1 SEI point. What that means, of course, is that holders of associate's degrees and vocational certificates did better on the job market in 1985

TABLE 5

OLS Regression, Earnings and Status for Holders of Baccalaureates

Independent Variables	Dependent Variables	
	Earnings	Status
Education		
Baccalaureate	$1,793***	7.7***
Demographic Variables		
Female	−$9,803***	3.8***
Non-white	$749	−0.5
Parents' SES		
Middle	$2,396***	1.7**
High	$4,230***	2.5*
Parents' Education		
High school only	−$217	−2.5
Some college	$2,074*	−1.0
Four-year degree+	$6,740	−3.4
Hours Worked in High School		
Zero	−$384	0.7
Some (4-6)	$856	−1.1
More (7+)	$570	0.1
High-School Program		
Academic	$816	3.8***
Technical	−$87	1.1
High-School Grades		
Excellent	$4,927***	14.3***
Good	$4,456***	9.6***
Average	$2,609***	4.0***
Educational Plans		
High school only	$1,617	6.9***
Technical	$ 618	6.5**
Junior college	$1,579	6.1
Four-year college	$3,023	8.3***
Graduate school	$3,700*	14.7***
Occupational Plans	−24	0.1**
Planned job status	−$54	0.1
Intercept	$12,237***	21.2***
Adj. R-square	0.24	0.30

NOTE: Number of cases = 3,143
$^{*}p < 0.05$. $^{**}p < 0.01$. $^{***}p < 0.001$.

than baccalaureate holders — not *all* baccalaureate earners, but those who began their educations in two-year colleges and then transferred to four-year colleges. Even the simple mean earnings and job status of the two groups (with no controls) show the same pattern (transfer baccalaureates: $23,078 and 49.0; sub-baccalaureates $24,170 and 50.1; see Table 8).

The persistence of this relationship both with and without controls is an important point. One often suspects that using controls may introduce an artificial or hypothetical or counterfactual element in one's reasoning. To ask oneself: what would *X* be like if it were not related to *Y*? is to invite oneself to forget that *X* is in fact related to *Y*. It is sometimes too easy to control statistically for variables that are not "controlled" in society. But our finding here is not one of those that is only true after controls. Earners of sub-baccalaureate degrees and certificates in this nationally representative sample did much better on the job market, better not only than those who ended their educations with high school, but also better than a substantial group of baccalaureate degree earners. And this relationship was *stronger* after controlling for our clusters of precollege variables.

Tables 6 and 7 repeat the analysis strategy, but this time for demographic subgroups in the population: males, females; blacks, whites; low-SES, non-low-SES. Again, for all groups we see that we can explain a substantially larger proportion of the variance for status than for income. In terms of income, females were the greatest beneficiaries; in terms of status, where all groups gained significantly, males benefited most. The income findings — nonsignificant earnings gains for males and substantial benefits for females — have been replicated on the HSB cohort [17]. This leads us to suspect the presence of a general effect. The gains for blacks are large and positive; but they are statistically nonsignificant because of the fairly small sample size and large standard errors. The male gains in status are probably because two-year college education enables many men to move from blue-collar to white-collar work. We are somewhat more tentative about the generality of the male advantage in status than about the female gains in income. We know of no directly comparable studies on different samples. But the effects of two-year college education on status for all groups are strong enough that we might conclude that they are general — were it not for the possible artifactual problem discussed above (education level is a component of the dependent variable).

Equity Effects

Does attending a two-year college and earning a degree reduce the gap between more and less advantaged segments of the population? The answer often depends upon how one defines "reduce the gap," absolutely or relatively. A simple example helps illustrate how we approached this complex question. Suppose we consider two individuals, A and B. A earns $10,000 before obtaining a degree; B earns $4,000. Each gets a degree. Now A earns $12,000 and B earns $5,000. Has education promoted income equity? The answer is clear: Yes and No. A originally

TABLE 6

OLS Regression, Earnings for Conditional Effects

Independent Variables	Male Model ($N = 1{,}968$)	Female Model ($N = 1{,}741$)	White Model ($N = 3{,}019$)	Black Model ($N = 430$)	Non-low SES Model ($N = 2{,}526$)	Low SES Model ($N = 1{,}183$)
Education						
Community college						
Degree earners	$1,152	$2,995***	$1,939**	$2,775	$2,239**	$1,894*
Non-white	−$114	$1,698**	—	—	−$699	$1,005*
Female	—	—	−$11,298***	−$5,100***	−$12,034***	$7,151***
Parents' SES						
Middle	$3,472***	$1,548**	$2,701***	$2,082*	—	—
High	$8,010***	$2,353*	$5,613***	$2,851	—	—
Parents' Education						
High school only	−$177	$291	−$198	$813	−S777	$2,014
Some college	$270	−$896	−$51	$115	$1,701*	$4,510
Four-year degree+	$3,820*	$6,084**	$5,363***	$3,551	$5,231***	N/A
Hours Worked in High School						
Zero	$−894	−$103	−$158	$367	−S187	−$541
Some (4–6)	$1,307	−$340	$201	$2,419*	S234	$1,231
More (7+)	$518	$276	$145	$1,932	S665	$363
High-School Program						
Academic	$768	$1,383*	$895	$3,536**	$1,407*	$651
Technical	−$340	$1,004*	$122	$839	S935	−$507
High-School Grades						
Excellent	$7,577***	$3,327**	$5,725***	$3,618	$6,758***	$2,900*
Good	$4,812***	$2,912**	$4,905***	$3,579*	$5,743***	$2,390**
Average	$2,297**	$1,501	$2,765***	$1,094	$2,944**	$1,613*
Educational Plans						
High school only	$1,138	$2,886	$1,167	$2,542	$923	$2,628
Technical	−$36	$1,495	−$270	$4,813	−$422	$1,252
Junior college	$474	$2,690	$365	$5,806	$63	$3,468
Four-year college	$3,637	$3,931	$2,957	$3,533	$2,495	$3,979*
Graduate school	$4,989	$5,100*	$5,289*	$4,731	$4,504	$3,295
Occupational Plans						
Planned job status	−$40	−$17	−$39	$95	−$31	−$13
Intercept	$13,500***	$1,579	$13,203***	$4,168	$17,700***	$9,065
Adj. R-square	0.14	0.11	0.27	0.17	0.24	0.19

NOTE: "—" denoting that variable was not entered and "N/A" denoting no cases. Non-white category (including blacks) is used only in gender and SES models. Because other minority groups have very small numbers, they are not included in the Ethnicity models.

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

made $6,000 more than B, but now makes $7,000 more. The absolute gap has increased. On the other hand, A's income increased 20% as a result of the degree, but B's increased 25%; before they each earned degrees, A's income was 250% greater than B's; after earning degrees, it was 240% greater. Which of these measures, the percentage difference

TABLE 7

OLS Regression, Occupational Status for Conditional Effects

Independent Variables	Male Model ($N = 1{,}968$)	Female Model ($N = 1{,}741$)	White Model ($N = 3{,}019$)	Black Model ($N = 430$)	Non-low SES Model ($N = 2{,}526$)	Low SES Model ($N = 1{,}183$)
Education						
Community college						
Degree earners	9.1***	4.6***	7.2***	5.0**	6.9***	7.5***
Demographic Variables						
Non-white	−3.4***	0.9	—	—	−2.0	−0.5
Female	—	—	2.0***	6.3***	2.1***	3.6***
Parents' SES						
Middle	0.2***	2.9**	1.8**	2.8	—	—
High	2.9*	2.5	3.9***	0.1	—	—
Parents' Education						
High school only	−1.0	−1.4	−1.3	0.3	−1.5*	−3.0
Some college	0.3	−2.4	0.2	9.2	−1.8	10.2
Four-year degree+	−1.1	−5.1*	−3.1	−2.4	−3.0	N/A
Hours Worked in High School						
Zero	0.1	2.5*	1.6*	2.5	2.0**	0.8
Some (4–6)	−1.2	0.4	−1.3	2.5	−1.8*	1.7
More (7+)	1.0	0.2	0.5	−2.1	−0.4	1.5
High-School Program						
Academic	3.5***	5.9***	4.3***	5.8**	4.4***	5.6***
Technical	−0.9	2.4**	0.9	0.5	1.4	0.3
High-School Grades						
Excellent	14.9***	15.9***	16.2***	9.1	16.9***	11.9***
Good	7.4***	10.2***	10.2***	15.0***	11.1***	8.0***
Average	2.6**	4.6**	4.9***	6.7**	5.5***	1.8
Educational Plans						
High school only	1.4	12.0***	5.9*	11.0	10.3**	3.9
Technical	4.5	9.1**	5.6*	5.8*	10.1**	2.6
Junior college	1.5	11.3**	4.4	14.8*	9.0**	3.1
Four-year college	7.5**	13.1***	9.1***	6.2	13.1***	4.9
Graduate school	13.9***	15.0***	13.9***	17.7**	19.8***	2.3
Occupational Plans						
Planned job status	0.1***	−0.1	0.1**	0.2*	0.1*	0.2***
Intercept	18.0***	24.0***	18.8***	14.4	18.7***	7.9
Adj. R-square	0.39	0.28	0.35	0.27	0.33	0.24

NOTE: "—" denoting that variable was not entered and "N/A" denoting no cases. Non-white category (including blacks) category is used only in gender and SES models. Since other minority groups have very small numbers, they are not included in the Ethnicity models.
*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

or the absolute difference, is the better indicator of equity? Neither really; that is why we use both.

To answer our equity question we compared the absolute and relative gaps for income and status between high-school graduates and two-year college degree earners. We did this for three pairs: blacks and whites, males and females, and low- and non-low-SES groups. If both the absolute and relative gaps between pairs changed in the same direction, we called the equity results "clear." If one went up while the other went down, we called the equity effects "mixed." We also made these comparisons twice: once without and once with controls for parents' education, students' grades, occupational aspirations, and our other precollege variables. The comparison *without* controls is arguably more meaningful in this instance. Using controls can be misleadingly counterfactual: for example, *if* low-SES students had parents as well educated as non-low-SES students, their SEI scores *would* have been such and such. But, in fact, their parents were not as well educated on average. Statistical controls are indispensable for studying the variables that mediate relationships and for uncovering causal links. But our initial question is different: what were the equity effects of the two-year college for actual people — not statistically controlled people with hypothetical values on our precollege variables? The answers are available in Table 8, which reports mean income and status for individuals from various groups who followed different educational paths.

In an attempt to simplify the data so that it is easier to see general

TABLE 8
Mean Earnings and Occupational Status by Postsecondary Paths

Postsecondary	Number	Mean Earnings	Mean Status
High-School Graduates Only			
Total	2,167 (58%)	$17,010	32.7
Male	1,144 (28%)	$21,801	28.6
Female	1,023 (27%)	12,749	36.5
White	1,722 (46%)	$17,918	32.6
Black	277 (7%)	$14,714	29.5
Low SES	915 (25%)	$15,633	30.8
Non-low SES	1,252 (33%)	$18,423	34.1
Community College Degree Earners			
Total	1,542 (42%)	$23.860	50.5
Male	824 (27%)	$28,084	49.3
Female	718 (23%)	$18,194	50.6
White	1,297 (42%)	$24,122	50.8
Black	153 (4%)	18,581	41.8
Low SES	268 (8%)	$18,329	43.9
Non-low SES	1,274 (34%)	$24,875	51.6
Sub-baccalaureate	566 (15%)	$24,170	50.1
Baccalaureate	976 (26%)	$23,079	49.5

NOTE: Percentages in parentheses are based on the total sample of 3,709.

patterns among absolute and relative effects both with and without controls, we created Table 9. It simply reports gains in equity as a plus "+" and reductions in equity as a minus "—". Panel A of Table 9 shows the general pattern of equity effects when no controls for precollege variables were included. The full details of the calculations are available in Appendix B. The predominance of negative signs (9 of 12) means that even while all individuals improve their positions as a result of attending a two-year college, advantaged individuals tend to benefit disproportionately. The results for our ethnic and social class groups are clear, and they are clearly negative. The gaps are bigger, absolutely *and* relatively. Blacks who attended two-year colleges were further behind whites who attended two-year colleges than blacks who graduated from high school were behind white high-school graduates. The same was true of students of low SES origins. For these groups in this sample, two-year college education increased *individual* opportunity, but decreased *social* equity. Lewis, Hearn, and Zilbert [17] studying HSB vocational school students and using a different measure of equity, also found no gains in equity for low-SES individuals.

Gender results are more complicated. Relative equity in earnings improves for females as a result of obtaining two-year degrees, but the absolute dollar gap between men and women increases. The only pair of plus signs in Panel A is for the gender gap in occupational status. However, the "disadvantaged" group in this instance is males. Male high-school graduates typically hold jobs lower in SEI points than female high-school graduates. When both go to two-year colleges and

TABLE 9

Pattern of Absolute and Relative Equity Effects of Two-Year College Degrees Compared to High-School Degrees

A. Without controls for precollege variables	Male & Female	White & Black	Low-SES & Non-low SES
Earnings	−/+	−/−	−/−
Status	+/+	−/−	−/−

B. With controls for precollege variables	Male & Female	White & Black	Low-SES & Non-low SES
Earnings	+/+	+/+	−/0
Status	+/+	−/−	+/+

NOTE: Absolute effects are to the left of the slash; relative effects are to the right; "+" = increases equity (reduces gap); "0" = no difference; "—" = reduces equity (increases gap).

earn degrees, the gap is reduced dramatically, both absolutely and relatively.

Panel B of Table 9 makes the same comparisons, but this time controlling for our list of precollege variables when calculating the gains for two-year college degree earners. (Again, see Appendix B for the actual figures.) Here the pattern is quite different. Positive signs predominate (8 of 12). But this panel of the table is generally more difficult to interpret. Two of the 12 coefficients (for males' and Blacks' earnings), though positive, are statistically nonsignificant. For the male-female comparison this poses no problem, because even if the male coefficient were significant, the result would be the same — a relative and absolute female gain. Just the opposite is the case for the black-white comparison: the black coefficient is larger but fails to reach statistical significance. The remaining four comparisons are clearer and generally follow the pattern in Panel A. With controls the male status gain is absolutely and relatively larger than the female gain. With controls, the black status gain is absolutely and relatively smaller than the white gain. Those two comparisons produce the same conclusions as those without controls. The SES earnings comparisons show gains for low-SES individuals that are the same or smaller as those for non-low-SES persons. The one clear contradiction in the results of the two panels is in the SES status comparisons. Here the positive equity results for low-SES individuals are clear if modest (less than one SEI point).

Discussion and Conclusions

Limitations Due to History or Era Effects

In general we recommend more doubt and less certainty about estimates of two-year college effects. Caution is especially pertinent when contemplating using time-bound data to draw timeless generalizations. The two-year college sector of the American higher education system has been highly dynamic. Thus it is hard to take conclusions based on data drawn from one period and apply them to other periods. Our data come from a time of change in the two-year college. Indeed, one could argue that all decades in the history of the two-year college have been "transitional" and that it is the most volatile sector of U.S. higher education. Be that as it may, it is always well to remember that our conclusions apply to one cohort only, a cohort that went to school and entered the job market at a time of change for the two-year college.

For example, the years we are discussing saw rapid growth in higher education in general and in two-year colleges in particular. From 1970 to 1985 enrollments grew from 8.6 million to 12.2 million students. The two-year college share of those growing enrollments increased from 27% to 37%. A smaller percentage of two-year college students was transferring to four-year colleges, and associate's degrees were becoming more important. The ratio of associate's degrees to bachelor's degrees moved from 0.26 in 1970 to 0.46 in 1985. In 1972, when our sample was graduating from high school and our precollege variables were measured, women earned 43% of associate's degrees; by 1985 when we measured income and job status, that figure had climbed to 55%. The same general pattern existed for bachelor's degrees (44% female in 1972, 51% in 1985). In short, the two-year college in the years under consideration in this study became increasingly prominent in the postsecondary system, and the proportion of women in higher education grew markedly. Some things did not change much, of course; for example, the percentage of high-school graduates aged 14–24 enrolled in college held pretty steady at around 33% between 1972 and 1985. Similarly, the unemployment rate for high-school graduates not in college aged 16–24 remained quite stable at around 12% [22, Tables 264, 270, and 291]. But the volatile indicators well outnumber the stable ones. In the face of so much change in two-year colleges, there is little reason to believe that their effects on their students' educational or occupational attainment have been constant or have changed monotonically.

Status and Income

Degrees and certificates earned via two-year colleges predicted more of the variance in job status than in income. This was true for all groups, but especially for males (adjusted $R^2 = 0.39$), whose status gains were the highest (9 points after controlling for precollege variables). Status stratification appears more open to the influence of two-year college credentials than does income stratification, especially for males. Some of this effect is likely due to the artifactual problems discussed above (the measure of status includes a measure of educational attainment). But most of it is probably not artifactual. Because credentials are, like status, at least partly symbolic (cultural capital, if you will), the finding that education contributes importantly to status makes basic theoretical sense.

Women's Income

Women in 1985, about a decade after they had left school, derived relatively more income from two-year college education than did men. This finding has been confirmed by other researchers using the HSB sample for 1985 income for subjects about 2 years after they had left school [17]. Also, a U.S. Commerce Department survey of full-time workers 25+ years old in 1989/90 showed a relative rate of return to baccalaureate degrees (compared to high-school degrees) 7% or 8% higher for women than men, but an absolute rate smaller for women than men. It seems safe to generalize that the higher *relative* rate of return to investment in education for women is a key fact about the U.S. stratification system and one that suggests several interesting avenues of investigation about the effects of education on income. Income equity for females seems to be more within reach, given the effects of current policies and structures, than similar equity for African-Americans and low-SES individuals. Of course, this is a relative, not an absolute, advantage for women. In what we argue is the better comparison (without controls), the gain was not in an absolute return, but in a *rate* of return. One reason women's rate of return might be higher is because their base is lower, lower even than for African-Americans and individuals of low-SES background. One final note: among all educational categories, income inequality between men and women was smallest among two-year sub-baccalaureate earners [1, 9]. This indicates that the comparative two-year degree benefit for women begins to weaken as they move from two-year degrees and certificates to bachelors' degrees. The relationship between education level and the gender gap appears to be U-shaped, not linear. If this is so, it could explain the comparative disadvantages of transfer baccalaureates, particularly if disproportionate numbers of them were women. (See Chapter 2 in Adelman [1] for further discussion.)

Sub-Baccalaureates and Transfer Baccalaureates

Sub-baccalaureate degree and certificate holders earned more on average and had slightly higher job status than those earning transfer-bachelors' degrees. And, important to note, this bivariate relation of education and earnings became *stronger* after we controlled for our list of precollege variables. This means that the specific institutional effects were stronger than would have been obvious had we not introduced controls. The bivariate mean advantage for sub-baccalaureates was \$1,091 (\$24,170 − \$23,079 = \$1,091, Table 8). After controlling for precollege variables it increased to \$2,337 (\$4,130 − \$1,793 = \$2,337, Tables 4 & 5). While this is but one sample (of 566 sub-baccalaureates and 976 transfer baccalaureates) in one year (1985), it is a finding that demands further investigation. It is important to discover whether this is a general effect true for students besides those in this sample. Is it generally the case that a bachelor's degree earned after passing through the community college is less valuable than a two-year degree or certificate as well as being less valuable than a bachelor's earned solely in a four-year school? This is an especially important question given the reemergence of the transfer function of the two-year college and the consequently large proportion of all baccalaureate earners who now begin their educations in two-year institutions.

There are several possible explanations for the apparently anomalous result that while holders of baccalaureates earn more than holders of sub-baccalaureate degrees, this relation was reversed when the baccalaureate holders had passed through two-year colleges.[6] We offer the following explanations; they are neither mutually exclusive nor exhaustive, and they cannot easily be tested with currently available data.

1. One explanation for the lower incomes of transfer baccalaureates is that because they entered the job market later they had fewer years of employment; therefore, they had less seniority than holders of sub-baccalaureates. This could account for some of the gap. On the other hand, to take a counterexample, the sub-baccalaureates had fewer years on the job market (because they spent more years in school) than the high-school graduates, but still earned more. Bivariate comparisons between the transfer baccalaureate and sub-baccalaureate groups show few differences between them that could account for the large difference in earnings. For example, in the seven years 1979–1985, the transfer-baccalaureate group was employed full-time 65 months (and unemployed an average of 2.1 months), while the sub-baccalaureate group was employed full-time for 66 months (and unemployed an average of 2.0 months).

2. Transfer baccalaureate students may have majored in subjects at the low end of the income scale. If indeed they majored in low-yield fields such as English, art, sociology, or history, this could explain some of their disadvantage in income. For example, in 1985, baccalaureate recipients employed full-time one year after graduation who majored in the humanities earned around $3,700 less than the average graduate [24, Table 377]. People with specific two-year credentials and skills, such as auto mechanics or dental hygienists, might have earned more than these humanities majors. Because of the problem of empty cells and therefore low statistical significances, it is not possible to do extensive tests of these relationships while retaining our list of precollege controls [9, 12, 13]. (For several interesting bivariate crosstabulations dealing with these issues see Adelman [1], especially Chapter 4.)

3. Transfer baccalaureates may have completed their four-year degrees in lower prestige colleges. These colleges, in turn, could have carried fewer job benefits. Because of the results of other research, we doubt that this is a major factor, but it has not been directly investi-

gated. Using HSB data Lee [15, pp. 96, 98] found that students who transferred to four-year colleges went to less selective institutions than four-year "natives" — a difference of three-tenths of a standard deviation. That difference became nonsignificant, however, once background variables were controlled.

4. A history effect may account for the advantage of sub-baccalaureates over transfer baccalaureates. Perhaps something about the state of the economy mid 1970s to mid 1980s explains this curious result. The most probable history effect relates to point 2 above. The late 1970s may have been a particularly bad time to enter the job market for holders of transfer baccalaureates, especially those who majored in nonvocational or nonprofessional fields. In the mid-1980s the fastest growing sector of the labor market was, and had been for some time, those jobs that required more than high school but less than college [20].

Any or all of these four explanations could apply. We know of no data that could adjudicate among them. While one could obtain data, for example, on transfer baccalaureates' majors cross-tabulated with gender, even with a huge sample like the NLS, it is hard to study such questions without running into the problem of subsample sizes so small that statistically significant results are rare [9, see also 12, 13]. Our best conclusion at this point is that the subject is very worthy of further study.

Individual Opportunities and Structural Barriers

For individuals whose only option for postsecondary education is a two-year college, that institution on average enhances not only educational opportunities but job opportunities. But how many such individuals are there? It is impossible to determine how many potential postsecondary students are in fact limited to the choice of a two-year college or no postsecondary education whatsoever. Choices are seldom wholly free or wholly constrained. Many of the community college students we studied had good grades in high school and came from middle-class homes. Some of those students in the NLS sample surely could have gone to four-year colleges. Several authors have found that many students who first attended community colleges and subsequently transferred to four-year schools could have gone to four-year schools in the first place [16].

The most systematic study of this question was done by Alexander et al. [2]. They examined both the NLS and the HSB cohorts (1972 and 1980 high-school seniors) and found that the community college was by no means a "dumping ground" for the academically inept. They looked at the probability of attending a four-year or a two-year college —

given that the student attended one or the other. They found much bigger SES background differences between those who went to any postsecondary institution and those who did not than between those who went to two-year versus those who went to four-year schools. They found that for both classes (1972 and 1980) blacks were no more likely than whites, and women were no more likely than men, to attend a two-year rather than a four-year school. The biggest differences were academic: students with good grades and test scores and who had taken a college preparatory course of studies were all quite a bit more likely to go to four-year rather than two-year colleges. But they were also more likely to go to two-year colleges than to stop with high school (see also Table 1, above). For example, among the 1972 cohort, students with high grades (one standard deviation above the mean) were 1.58 times more likely to attend a four-year rather than a two-year college than students with low high-school grades (one standard deviation below the mean). But, none of the differences was particularly large. As Alexander et al. conclude, "many good students start out in two-year schools, and many youngsters with poor scholastic credentials enroll in four-year colleges" [2, p. 77]. Furthermore, as Lee et al. [15] point out, for students in the 1980 graduating class who transferred (and who for the most part could have gone to a four-year college in the first place), the two-year college posed no disadvantage for subsequent educational attainment. The odds of persisting to a bachelor's degree among the 1980 cohort (but not the 1972 cohort) for transfers and "natives" were nearly identical — with or without controls for background variables. (Compare the NLS results of Whitaker & Pascarella [25]).

The similarity of student backgrounds in the two- and four-year schools is a double-edged compliment to the community college, however. If the community colleges have students fully as qualified as the four-year schools on the whole, they clearly are not a "dumping ground." But this also means that they are not especially important as the only place the poor and the poorly prepared can gain access. The poor and the poorly prepared might do quite nicely, it would seem, in four-year state colleges, where tuition is seldom much higher than in two-year colleges.[7] Whatever costs might be incurred from having to live away from home might well be compensated for by the prospect of ultimately higher earnings.

In theory, then, looking at the question from a micro-choice level, many students who attended two-year schools could have entered four-year schools. But, looking at the same question from a macro-structural perspective, there are not enough empty places in four-year colleges to handle all five million or so community college students. The fact that such places do not exist for students, many of whom "could" go to four-year schools, means that they actually could not. Because people with characteristics similar to their own are in four-year schools does not mean that there is room for them too. This fact strengthens the arguments of the critics. It points to a structural barrier to equality. Given the current institutional structure of American higher education, many students may in fact be confronted with the option of community college postsecondary education — or none at all. For those students, it appears that the community college is a choice that can improve individual occupational outcomes. But the structures that limit their options to that choice of postsecondary education may not be most beneficial in terms of individual opportunity; it is especially suspect in terms of social equity.

As one thinks about structural reform that could reduce the equity disadvantages of two-year colleges, having more students attend four-year colleges and universities is the most obvious approach. While there is some underenrollment in state four-year colleges, it is not extensive enough to handle many of the students who now attend two-year schools. The two main ways more four-year colleges places could be created are converting two-year into four-year colleges and making two-year colleges branches of state university systems. (See Dougherty [7], especially Chapter 15, for a discussion.) When one imagines the costs of such reforms, however, especially in light of current realities — miserly legislatures and ungenerous voters — it is hard to be optimistic.

Equity Effects

One of our main conclusions is that individuals from all groups on average improved their earnings and/or job status by attending two-year colleges and earning certificates or degrees. Thus, the two-year college opened a clear avenue of individual opportunity. If we conceptualize "equity" as improvements in individuals' chances for upward mobility, then the two-year colleges were clearly equity generators. But on average, *group* equity — the gap between more and less advantaged groups — whether measured absolutely or relatively, was more often worsened by further education in two-year schools. The chief exception was the paradoxical result that the job status gap between males and females is all but eliminated by successful study in a two-year college. But the "disadvantaged" group in this case is males. Eliminating females' one area of advantage may not satisfy some readers' definition of "equity." The other exception is a mixed case, one in which the absolute gap between men and women increased but the relative gap decreased. For our other four comparisons (income and status for blacks and whites and for low-SES and non-low-SES individuals) equity outcomes were all negative. Equity *decreased* as a result of two-year college effects. When we controlled for precollege variables, we got some more equitable results, but they were complicated by low statistical significance and were not easy to interpret. At best, strong claims for social equity for the relations among *groups* as a result of two-year college education will have to await further study.

As Pincus [19] put it, looking at the equity from a structural perspective, if the system is unequal, the community college, by helping students adjust to the system, perpetuates that inequality. But, we would ask, from an individual perspective, what is a disadvantaged person to do? Make the best of a bad deal and go to a two-year school or make the worst of a bad deal and drop out of the education system? If you are on a backward moving treadmill, you have to run to keep from falling behind. Even if the treadmill moves faster than you can run, you fall less far behind than when you stand still. This is roughly the situation of students from the disadvantaged groups in our study. They continued to fall behind even when they attended a two-year school, but not always as quickly as if they had finished their educations with high-school graduation.

We do not claim that one of these perspectives and the accompanying comparisons (macro-structural versus micro-individual, group equality versus individual mobility) is legitimate and the other is not. Rather, each highlights parts of the postsecondary education system and its relation with the system of social stratification. The worst distortions come from looking at the system from only one perspective. Also problematic is trying to talk about *the* effects of two-year colleges or any other main sector of the higher education system. It is almost always more accurate to discuss the "varied effects of postsecondary education" [11, 12, also 7]. But certain broad generalizations are possible and useful. We conclude with these.

The two-year college is clearly intermediate between the high school and the four-year college. While there is considerable overlap, two-year college students tend to have more academic resources than those who end their educations with high school but fewer resources than those who go directly to a four-year school. This intermediate position enables both the critics and the supporters of two-year colleges to be partly right: attending a two-year school is better than going to none at all for most individuals, but it is not as good as going to a four-year school in terms occupational outcomes. Of course, these generalizations are based on averages. A high-yield program in a two-year school might be a much better bet than a low-yield program in a low-prestige four-year school. On the other hand, a low-yield vocational program training for jobs in an overcrowded market may add little if anything to the earnings power of its graduates and may even result in a negative return to investment.

Clearly, the postsecondary world is made up of a wide range of institutions and programs within them. There are many levels in the hierarchy. We have trouble measuring them and their effects, even with gigantic samples such as the NLS. In some respects, given the huge diversity of institutions and programs in two-year colleges, it is surprising that we can explain around one-quarter of the variance in occupational outcomes by using crudely measured variables that conceal much diversity, for example, degree, yes/no; parents' SES, low/mid/high. Programmatic and institutional variety within two-year colleges is extensive enough and diversity among students and their goals is substantial enough that critics and supporters will almost always be able to muster some evidence for their positions.

Yet we have arrived at some main conclusions that suggest some directions for further research. Going to a two-year college in the 1970s — as compared to stopping with high-school education — improved individuals' occupational outcomes. For some groups of individuals, such as men and blacks, the improvement was significant only in job status, but not income. For other groups, such as women, the income benefits were much larger. But members of all groups on average got at least some benefits. This means that a two-year college education culminating in a degree improved individuals' occupational outcomes and equalized individual opportunity. However, when we look more broadly, at the relationships *among* groups, we see a different picture. Concerning the inequality between groups as we move from one education level to the next, we find that increasing education by the same amount (from high-school graduation to a two-year degree) most often reduced social equity. In brief, the two-year college enhanced individuals' opportunities but left patterns of intergroup inequality at best unchanged.

Notes

[1] Our working definition of "two-year college" in this article is: all *public* two-year colleges. In the years 1972–79 around 96% of all students in two-year schools went to public institutions [24, Table 170]. While these schools included some technical and vocational colleges that were not strictly speaking community colleges, the vast majority of students who went to public two-year schools attended community colleges properly so called, i.e., public institutions jointly governed and funded by local (community) and state authorities.

[2] Such serious students are not as rare as one might think. Over half of the entering students in community colleges pursue full-time study. Also, over 80% of the NLS stu-

dents who ever went to a two-year college did so within 18 months of graduating from high school [1, p. 138].

[3]We also ran our regressions using listwise deletion, i.e., eliminating from the list of cases those that had any missing information. The results (available upon request from the authors) were parallel to those obtained with mean substitution and did not lead to different interpretations.

[4]We report our results in the original metric (not standardized coefficients). Also, despite the fact that some of our variables were quite skewed (especially 1985 earnings), we do not use logarithmic or other transformations. We do this for two reasons: (1) the meaning of unstandardized and untransformed regression coefficients of the sort used here is very clear and aids our interpretation. On the other hand, taking the natural log of our dependent variables or reporting regression coefficients in standard deviation units yields little that is directly interpretable, except for the significance tests. (2) Whitaker and Pascarella [25] using the same data base, mostly the same variables, and many of the same subjects found that the natural log of earnings results "differed only in trivial and nonsignificant ways" (p. 201) from coefficients in the original metric.

[5]The *N*s are smaller because the 976 transfer baccalaureates are not included in Table 4, and the 566 sub-baccalaureates are not included in Table 5.

[6]In 1985, for example, the gap between the median income of householders with 1-3 years of education and those with 4 or more was around $12,000. [21, Table 724]. In 1992 the gap in mean annual earnings between those with associates' and bachelors' degrees was about $8,000; the gap between holders of bachelors' and those with some college but no degree was roughly $13,000 [23]. The transfer baccalaureates also fared poorly in another measure of economic well being, home ownership. For example, taking only students whose parents were in the lowest SES quartile, the rates of home ownership by degree were as follows: no college, 59.1%; associate's degres, 64.5%; transfer baccalaureates, 45.2% [1].

[7]While varying considerably from state to state, on average tuition in public two-year colleges exceeded that in public four-year colleges by less than $1,000 per year. Even in the early 1990s, the difference was less than $1,200 per year [7, p. 48]. Although several hundred dollars per year was not a trivial sum in the 1970s, especially for low-SES students, it was not a major component of the total cost of attending college. The main cost of going to a public college has always been foregone earnings. Second in importance is living expenses (room and board). It is here that two-year colleges can save their students considerable money — but only assuming that no public four-year college is within commuting distance.

APPENDIX A

Variable List

Variable Name	Definition and Coding
Independent Variables	
Two-year college degree earners	Data from the students' transcripts. Those who entered a two-year college by 31 December 1973 and persisted to a vocational certificate, an associate's degree, or transferred and obtained a bachelor's degree were coded 1. Students ending their educations with high-school graduation were coded 0.
Sex	Female = 1; Male = 0
Ethnicity	Non-White = 1; White = 0
Parents' SES	An average of father's and mother's occupational status, family income, education and household items in 1972 base year. This NLS composite was broken into three categories: low, middle and high; coded as a series of dummy variables, with "low" the excluded category.

APPENDIX A (*Continued*)

Variable Name	Definition and Coding
Parents' education	An average of mother's and father's score on a scale of 1 to 5: 1 = less than high school; 2 = high-school graduate; 3 = some college; 4 = college graduate; 5 = graduate or professional school. Coded as a series of dummy variables, with "less than high school" the excluded category.
Hours worked in high school	Four categories: none; few (1-3 hours); some (4-6 hours); 7 or more hours. Coded as a series of dummy variables, with "few" as the excluded category.
High-school program	Three categories: general; vocational-technical; academic. Coded as a series of dummy variables, with "general" the excluded category.
High-school grades	Based on students' self-reports. Four categories: excellent, good, average, poor. Coded as a series of dummy variables, with "poor" the excluded category.
Educational plans	Students' self-reports of the highest educational level they planned to attain. Six categories: less than high school, high school, technical school, junior college, four-year college; graduate or professional school. Coded as a series of dummy variables, with "less than high school" the excluded category.
Occupational plans	Students' responses to an open-ended question about the occupation students "planned to go into." Responses were then scored as Duncan SEI points as, updated by Featherman & Stevens 1982.
Dependent Variables	
Occupational status	Duncan SEI score (as updated by Featherman and Stevens) of responses in February 1986 to an open-ended question about current or most recent employment.
Earnings	Annual income for 1985 reported by respondents in February 1986.

APPENDIX B

Calculations of Absolute and Relative Income and Status Gaps

A. Without controls for precollege variables

Average Annual Income in 1985 for 1972 HS graduates

		Males	Females	*Abs Gap*
HS degree		21,801	12,749	9,052
CC degree+		28,084	18,194	9,890
Value added		6,283	5,445	
Value added %		28.8	42.7	
Relative Gap				
HS male/female	1.71			
CC male/female	1.54			

	Whites	Blacks	*Abs Gap*
HS degree	17,918	14,714	3,204
CC degree+	24,122	18,581	5,541
Value added	6,204	3,867	
Value added %	34.6	26.3	

APPENDIX B (*Continued*)

		Whites	Blacks	*Abs Gap*
Relative Gap				
HS white/black	1.22			
CC white/black	1.30			

		Non-low	Low-SES	*Abs Gap*
HS degree		18,423	15,633	2,790
CC degree+		24,875	18,329	6,546
Value added		6,452	2,696	
Value added %		35.0	17.2	
Relative Gap				
HS non-low/low	1.18			
CC non-low/low	1.30			

Average SEI Points in 1986 for 1972 HS Graduates

		Males	Females	*Abs Gap*
HS degree		28.6	36.5	7.9
CC degree+		49.3	50.6	1.3
Value added		18.2	12.3	
Value added %		72.4	38.6	
Relative Gap				
HS male/female	0.784			
CC male/female	0.974			

		Whites	Blacks	*Abs Gap*
HS degree		32.6	29.5	3.1
CC degree+		50.8	41.8	9.0
Value added		18.2	12.3	
Value added %		55.8	41.7	
Relative Gap				
HS white/black	1.11			
CC white/black	1.22			

		Non-low	Low SES	*Abs Gap*
HS degree		34.1	30.8	3.3
CC degree+		51.6	43.9	7.3
Value added		17.5	13.1	
Value added %		51.3	42.5	
Relative Gap				
HS non-low/low	1.11			
CC non-low/low	1.18			

B. With controls for precollege variables

Average Annual Income in 1985 for 1972 HS graduates

APPENDIX B (*Continued*)

		Males	Females	*Abs Gap*
HS degree		21,801	12,749	9,052
CC degree+		22,953	15,744	7,209
Value added		1,152*	2,995	
Value added %		5.3	23.5	
Relative Gap				
HS male/female	1.71			
CC male/female	1.46			

		Whites	Blacks	*Abs Gap*
HS degree		17,918	14,714	3,204
CC degree+		19,857	17,489	2,368
Value added		1,939	2,775*	
Value added %		10.8	18.9	
Relative Gap				
HS white/black	1.22			
CC white/black	1.14			

		Non-low	Low-SES	*Abs Gap*
HS degree		18,423	15,633	2,790
CC degree+		20,662	17,527	3,135
Value added		2,239	1,894	
Value added %		12.2	12.1	
Relative Gap				
HS non-low/low	1.18			
CC non-low/low	1.18			

Average SEI Points in 1986 for 1972 HS Graduates

		Males	Females	*Abs Gap*
HS degree		28.6	36.5	7.9
CC degree+		37.7	41.1	3.4
Value added		9.1	4.6	
Value added %		31.8	12.6	
Relative Gap				
HS male/female	0.783			
CC male/female	0.917			

		Whites	Blacks	*Abs Gap*
HS degree		32.6	29.5	3.1
CC degree+		39.8	34.5	5.3
Value added		7.2	5.0	
Value added %		22.1	16.9	
Relative Gap				
HS white/black	1.11			
CC white/black	1.15			

APPENDIX B (*Continued*)

		Non-low	Low-SES	*Abs Gap*
HS degree		34.1	30.8	3.3
CC degree+		41.0	38.3	2.7
Value added		6.9	7.5	
Value added %		20.2	24.4	
Relative Gap				
HS non-low/low	1.11			
CC non-low/low	1.07			

*Not statistically significant at the 0.05 level.

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Book Reviews

The University as an Institution Today, by Alfonso Borrero Cabal. Ottawa, Canada: International Development Research Centre; Paris: UNESCO, 1993. xxiv + 239 pp.

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The University as an Institution Today is an ambitious project. It attempts to address in a global context virtually all the current issues and debates concerning the university. It does this from a variety of perspectives: historical, contemporary, and prospective. The book owes its origin to three organizations: the United Nations Educational, Scientific and Cultural Organization (Unesco), the International Development Research Centre (IDRC), and the United Nations University (UNU), as well as to a number of individual experts on higher education. Unesco commissioned Cabal to review and synthesize a number of reports on the present situation of higher education, and the challenges that are facing it in Africa, the Arab States, Asia, Europe, Latin America, the Caribbean, and the Pacific.

The book is introduced by a rather lengthy foreword (pp. ix–xxii) by Marco Antonio Roderigues Dias, who is the director of the Higher Education Division of Unesco. The foreword highlights some of the challenges facing higher education, and provides some analytic insights into Cabal's book.

The book has four main parts. The first part takes an overview of the historical development and geographic spread of the university. It also traces the beginnings of written accounts and studies about the university and considers rather critically the mission and roles of the university and the vexing issue of autonomy.

The second part examines the structures, functions, and resources of the university. The organizing idea for this part is what the book sees as the first meaning of administration: "the organization and internal functioning of the university" (p. xxiv). The "epistemological" or collegial, and the "deontological" or bureaucratic structures (p. 54) of university administration, including their respective composition and responsibilities and the various categories of the university's human as well as material resources are discussed. An underlying thesis in this part is that organizational structure and human and material resources are necessary for the university to pursue its goals of research, teaching, and public service.

The third part is a logical corollary of the preceding part. It describes a variety of ways in which the university serves society. Here the view is presented that the university is able to carry out its services as a result of the way it is organized internally. The undergirding idea for this part is the book's second and external meaning of administration: service to society. Hence, this part is entitled, "To administrate is to serve." Four key types of service are discussed: service to culture, service through the professions, university extension services, and service through interinstitutional relations.

In the fourth part of the book the author focuses on planning and evaluation. In this section the rationale for planning and evaluating the activities of the university and the processes and problems that these two activities entail are considered.

Besides providing a historical perspective on the development of the idea and configuration of the university, the book goes beyond synthesizing and reviewing reports prepared for Unesco's regional meetings as well as other literature on higher education in general and the university in particular, to articulate, even if in snippets, the author's preferred idea of the university. In the model the author seems to prefer, the autonomy of the university is "inherent," "natural," and must be respected "whatever the founding organization" (p. 54). Notwithstanding its awareness of the contemporary conditions unconducive to and undermining university autonomy (p. 125), the book curiously insists, as it were, on autonomy by theoretical fiat: "Whatever its present-day or future situation, it is the function of the university as an institution to establish its principles, its course, and its goals" (p. 36).

Inviolate autonomy is not the only idealistic or classical characteristic of the author's model of the university. Aspects of internal organization and operation of the university also tend to be idealized. For instance, on decision making in the university, "deciding" is defined as "the turning point in the process of reflection and maturation of reasons and arguments" (p. 63). The definition is idealistically rational. This idealized view of the inner life of the university, however, does not reflect reality in many cases, such as, decision making driven by political, economic, and ideological argument and expediency. Consensus decision is idealized, and decision making by majority vote is looked down upon. But in the end, the attempt to distinguish between decision by consensus and decision by majority vote is not successful, given that decision by consensus is often, if not always, formalized by vote, whereas decision by vote is generally preceded by deliberation and discussion, which is the hallmark of the consensual decision-making process.

The model of the university the author seems to advocate overlooks the fact that conflict and tension are a reality of the university. In the internal meaning of administration and in the discussion of university structures and processes there is no consideration of the university as a political and politicized arena. Rather than facing up to this reality, the book indulges in prescribing normative balances and an equilibrated state of affairs:

> Professors, because of their scientific and pedagogical quality, have a recognized and accepted command over their students and colleagues. . . . It has been like this since the origin of the universities, and it is and should be like this today. . . . At the second, institutional level, there should be balanced agreements between the epistemological authority which deals with the everyday task of the academic structure and the deontological or bureaucratic authority of the institution's general structure. . . . There should also be balance between the educational institution and the pre-existing entity from which it arose (p. 54).

In the author's ideal-type model of the university, professional and occupational skills are subordinated to personal, intellectual, moral, and cultural development. Concerning university pedagogy, there is an acknowledgement that the use of the seminar mode of instruction is often not feasible and effective as a result of large numbers of students. Yet the book advocates more seminar-type instruction without offering recommendations as to how to make this both feasible and effective. The increasing use of communications technologies in university pedagogy is noted, but the author appears unenthusiastic about this phenomenon. He, instead, cautions:

> Once again, we can ask ourselves about the formative and educational value of these and other procedures; . . . there is a danger of confusing education with instruction and ignoring social and communication aspects, which are so necessary in the formative process (p. 114).

Whereas the reports that the book reviews take a more realistic view of the state of the university, the author's preferred idea of the university tends to be idealistic, elitist, or of yore. Thus, the book appears somewhat schizophrenic, owing to the apparent irreconcilability of some of the author's positions with the realistic approach and with accounts of the background reports. For instance, while the author affirms university autonomy, Jelinic (1988) is cited (p. 159) as maintaining, "Universities at present, and even more in the future, cannot be viewed as independent and autonomous parts of the social structure, but as its integral part."

The title of Cabal's book invites the reader to an exploration of the state of the university "today." But the realistic appreciation promised or suggested is largely not realized. Given that the stated concern of the book is the university's future (p. 188) and considering the author's own idea of the university, the book can be said to be more normative and prescriptive than descriptive and analytical. This, however, does not vitiate its strength as an ambitious, if not a comprehensive, synthesis of some key reports on the university in a global context, mainly generated in the second half of this century. In addition to finding the global overview it presents useful and interesting, students of higher education will also appreciate the book's rich historical account of the development of the university and the author's rather classical view of the institution.

Strengthening Collegiate Education in Community Colleges, by
Judith S. Eaton. San Francisco: Jossey-Bass, 1994. 181+ pp.
$30.95 /

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The dramatic growth in community colleges and in the number of students served during the past forty years has been paralleled by an increase in the number of analyses of the social and educational roles of the community college. These analyses include Clark's "cooling-out function," Zwerling's "second best," Brint and Karabel's "diverted dream," and Dougherty's "contradictory college."

Over a decade ago, in order to understand better the works cited above and others, I suggested that we apply a sociology of knowledge approach and, in particular, that we utilize Robert Merton's "insider/outsider" dichotomy [1].

Briefly, I proposed that as a result of their education, present affiliations, and intended audiences insiders (likely to be community college-based) usually defend the institution, and outsiders (likely to be research university-based) usually criticize the institution. I continued on to suggest that as a result of structurally based differences, insiders and outsiders may have different perspectives and interests and may therefore talk past one another; they even publish in different journals. In her well-written, well-reasoned, thought-provoking, and brief book, Eaton has shown that it is possible to take advantage of the insights afforded both insiders and outsiders.

Judith S. Eaton presents a challenge to the simple insider/outsider dichotomy. She looks like an insider (e.g., instructor and administrator at community colleges, president of two community colleges, member of the board of the American Association of Community Colleges); however, as will be made clear, she often sounds like an outsider. At the time of the publication of this book, she was president of the Council for Aid to Education. Most recently, she was named chancellor of the Minnesota State Colleges and Universities. In her terms, she looks like a friend but often sounds like a critic.

Eaton sees her book as an attempt, "to sustain a vision of the community college as a serious academic institution" (p. xv). This requires more than a strengthening of collegiate education; it requires a *strong collegiate commitment* or a college with a *dominant collegiate function.* As long as the community college provides access to experiences that are intellectually less demanding than the rest of higher education, it will continue to do "serious damage to itself by becoming a site of compromised educational opportunity, a shadow of what it might be" (pp. xiv-xv).

The four necessary conditions for a collegiate community college are: (1) Structured, sequential liberal arts and career education offerings should dominate the enrollments and the curriculum. (2) Primary attention should be given to college-level competencies rather than precollege competencies (developmental/remedial offerings). (3) The environment of the community college should try to ensure that students will be both interested in and prepared for baccalaureate study. (4) The community college should acknowledge its responsibilities as a good citizen of the higher education community; it should cooperate with other colleges and universities so that students, if they choose, will be able to transfer with ease. There is no doubt that Eaton stands with those of us who argue that the community college must use higher education institutions rather than secondary institutions as its primary reference group. Eaton's response to those who suggest that the collegiate model is a deviant one is twofold. First, she counters that this function has been present throughout the history of community colleges. For that matter of fact, "The liberal arts and transfer function was key to the establishment of the early junior college" (p. 6). Of course, the origins of an institution cannot account for its continued existence. In terms of contemporary conditions, Eaton points out that "the development of a dominant collegiate function has been encouraged by the great national need for more challenging education, a better-informed citizenry, and a work force with flexible skills and an ability to think independently" (p. 6).

In spite of the above, the collegiate model has not enjoyed strong support from the official leadership of the community college movement. This has been particularly true during the past thirty-five years. It was during this period that two friends ("insiders") of the community college, Edmund Gleazer and Dale Parnell, championed alternative models. Gleazer, president of the American Association of Community Colleges from 1959 to 1979, supported a community-based model, and Parnell, his successor for the period 1979 to 1991, supported the occupational education model. However, throughout this period, a team of UCLA friends, Arthur Cohen and Florence Brawer, kept the collegiate function alive within the context of a comprehensive model.

Eaton completes the chapter in which she discusses friends with a discussion of critics ("outsiders"). She agrees with the critics that measured by educational attainment, occupational status, and earnings, "the community college does not produce much for its students" (p. 67). However, for reasons of insufficient evidence, she does not accept allegations that community colleges systematically and intentionally set out to preserve social inequality (Have any serious critics made this argument?), that these colleges have become vocationalized, or that leadership ignores the desires of students who continue to show interest in the liberal arts and the transfer function.

In my introductory comments I suggested that insiders and outsides frequently talk past one another. In a similar vein, Eaton observes, "The respective positions of the friends and critics of the community college cannot be reconciled. These two groups start from very different assumptions about how to evaluate the community college" (p. 71). For instance, friends focus on the gains made that would not have been made in the absence of community colleges, and critics focus on the gains they believe ought to have been made (e.g., graduation, transfer, baccalaureate-degree attainment). If the friends value access and opportunity, the critics value achievement and excellence. Eaton may be too pessimistic here. There are different assumptions about how to evaluate the community college, however, there appears to be agreement that community colleges must serve the educational needs of the communities in which they exist. Beyond this general level of agreement, I suggest that through greater interaction, communication, and collaboration the assumptions of friends/critics and insiders/outsiders can be reconciled or at least made explicit and mutually understandable. Eaton's collegiate model provides a basis for such reconciliation and understanding.

Eaton's intended audience includes scholars of the community college and their students; community college faculty, trustees, and administrators; and "elected and appointed policy makers and all those whose decisions affect some part of the future of the community college" (p. xiii). I recommend the book to anyone interested in reading the best case for the collegiate community college and one of the best surveys of the competing visions of the social role of the community college.

As long as the over twelve hundred community colleges nationwide continue to be community-oriented, any model that claims legitimacy must demonstrate its ability to provide for the educational needs of the communities and populations the particular college serves. In addition, the model must demonstrate its ability to provide for academic access and achievement. If this book does no more than stimulate debates at the institutional level concerning the meaning of community-oriented and academic access and achievement at the beginning of the twenty-first century, it will have made a valuable contribution.

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Academic Libraries: Their Rationale and Role in American Higher Education, edited by Gerard B. McCabe and Ruth J. Person. Westport, CT: Greenwood Press, 1995. 230 pp. $.

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Academic libraries are encountering increasing accountability pressure from college and university administrators who are confronted with decreasing fiscal resources. The academic library is no longer automatically considered to be what Charles William Eliot, former president of Harvard, once declared the "heart of the university." It is no longer free from evaluation and assessment scrutiny and budget constraints and cuts, and due to the changing nature of the college and university environment it has had to reevaluate its role and function in higher education.

Academic Libraries: Their Rationale and Role in American Higher Education is a comprehensive collection of essays that examine the changing role of the academic library in American institutions of higher learning. Edited by Gerard B. McCabe, the director of libraries at Clarion University, and Ruth J. Person, vice-president for academic affairs at Ashland University, this publication strikes a perfect balance between the contrasting and sometimes complementary viewpoints of academic librarians and college and university administrators, who are the primary audience for this publication. Although this book cannot be substituted as a textbook because it does not contain many theories, library and information science and higher education faculty members will find it useful for its contribution to the knowledge and practice of academic library and higher education administration.

The book is divided into twelve chapters and concludes with a selective, annotated bibliography. In Chapter 1 Joanne R. Euster discusses the history and the evolving role of the academic library in American higher education. Chapter 2 differentiates the needs of a community college academic library from a traditional liberal arts and research university library. Chapters 3 and 4 examine the academic library from the college and university administrators' point of view, namely, the college dean and the provost. Chapter 5 addresses the changing education needs of academic librarians working in today's technologically oriented society. Chapter 6 is directed at current academic library professional staff and their need for continuous training and development. Chapter 7 offers career advice for academic librarians who are interested in moving into a managerial position in library administration. Chapter 8 focuses on the changing collection development needs in the evolving college and university environment. Chapter 9 discusses the different avenues that colleges and universities use to fund their academic libraries. Chapter 10 examines organizational behavior and management theories of organizational structure and design and discusses how academic library administrators can use these theories to design a more effective academic library organization. Chapter 11 analyzes the future of the academic library in the context of the changing college and university setting. Chapter 12 presents a fictional dialogue between the director of the academic library, the director of computer services, and the chief academic officer. Each director explains his or her role in the educational institution, how their roles are different, similar, and symbiotic. Finally, the book ends with a selective, current, annotated bibliography of articles and books related to the topics examined in the book.

Academic Libraries contains many strengths and a few weaknesses. Among the strengths are the breadth of the topics covered, the arrangement of the topics to provide cohesiveness, the expertise of the authors of the essays, and the readability of the entire volume for higher education scholars who may be unfamiliar with the structure and nature of the academic library surroundings.

The book addresses many topics, starting with the history of the academic library, which provides a foundation for the essays that follow. Essays address the concerns of academic administrators, library managers, library staff, and library science faculty. Similar topics are grouped together, and the essays flow seamlessly from chapter to chapter, each essay building on the information obtained from the previous chapters. The majority of the essays were written by senior library officers, usually deans or directors, and senior academic officers, many of whom have had an extensive professional and scholarly background on the topic that they wrote about. Higher education scholars will be able to read the articles and understand the basic concept of the function and role of the academic library in higher education.

One major weakness of the publication is the glaring omission of essays related to technology and the academic library. Except for one article in Chapter 12, which analyzes the relationship between the computer technology department and the academic library, and an article about the community college, which discusses the electronic library, the implications of the burgeoning technological advances on the academic library are not addressed. *Information Technology and the Remaking of the University Library* is another work that contains many essays similar in nature to the essays in *Academic Libraries* but in addition contains numerous essays on technology in relation to the library.

The editors of *Academic Libraries* have provided an excellent presentation of the issues and concerns facing the academic library as it evaluates its changing duty in higher education. Refreshingly, the authors of the essays also provided solutions to the problems that they addressed.

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Robert C. Nordvall
John M. Braxton

An Alternative Definition of Quality of Undergraduate College Education

Toward Usable Knowledge for Improvement

The 1980s saw a spate of reports focused on the improvement of the quality of undergraduate college education. Major reports included those issued by the study group on the Conditions of Excellence in American Higher Education [31], the American Association of Colleges' *Integrity in the College Curriculum* [3], and the National Endowment for the Humanities' *To Reclaim a Legacy* [5]. Although the flow of reports has abated in the 1990s, the issue of improving the quality of undergraduate college education remains. What also remains is a growing interest among the public in discerning the comparative quality of undergraduate institutions. The rankings of colleges in various categories each year in *US News and World Report* is a response to this growing public interest. Another response is the growth of unconventional college guides that provide "inside" perspectives on institutions that go beyond the more descriptive summaries in the traditional college guides such as Barron's *Profiles of American Colleges* and Lovejoy's *College Guide.*

The growing interest in comparative college quality among the public is premised upon two desires. The first is the desire to obtain a good bargain for the money spent on higher education, which has become more important as the costs of higher education have accelerated. The second is the desire of many students to obtain a degree from the most prestigious institution of higher education possible, because the prestige of one's un-

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dergraduate institution is seen as facilitating success later in life. High prestige institutions are seen as worth the high costs of attendance.

Whereas the public may often frame the issue of "quality" in terms of which school is "best," the various reports on the quality of undergraduate college education have as their goal an improved system of higher education to serve society's needs. If the quality of undergraduate education is to be improved, then quality must be defined in some way that provides useful information for the development of institutional policy to institute such improvement [13].

Traditional Approaches to Defining Academic Quality

Three customary approaches to addressing the question of quality in undergraduate higher education are the reputational approach, the resources approach, and the value-added approach. The reputational approach defines quality in terms of a college's or university's rank in the pecking order of institutions [2]. The *US News and World Report* annual rating of undergraduate institutions is a good example of the reputational method of appraising quality or excellence: the higher an institution's perceived place in the institutional pecking order, the higher the quality of the institution. A major problem with the reputational approach is that it is not clear whether the various persons who rank institutions are using the same criteria of evaluation, and even if the criteria are specified, the question arises whether the persons doing the ranking have access to reliable evidence on how well individual institutions meet these criteria.

The resources approach, in fact, is an attempt to specify and assess the criteria that are the bases for institutional reputations. Thus, the resource approach delineates quality by applying criteria such as SAT or ACT scores of entering first-year students, the number of books in the institution's library, or the scholarly productivity of its faculty [2]. Under this approach, the higher the average test scores of entering first-year students or the larger the library collection, the higher the quality of the institution.

Jacobi, Astin, and Ayala [17] point out that both the reputational and the resources approach are highly interdependent. An increase in reputation can bring additional resources to an institution, and an increase in resources can also yield a greater reputation. At first glance it seems that information useful to institutional policy can be obtained from these two approaches. If an institution is able to increase either its reputation or its resources, then it will also increase the quality of the undergraduate experience. However, there are two problems with the usefulness of this information. First, as Astin notes [2], resources available to most institutions are finite. Competition for the most able students and faculty is intense, and most institutions will not be successful in such competition. Second, most institutions are already aggressively seeking funds from alumni, corporations, foundations, and so on. This competition too is intense, and most institutions will not be far more successful than other institutions with a similar potential for raising outside funds. Furthermore, the relationship between financial resources and student outcomes is uncertain [7]. Thus, the reputational or the resources approach to defining quality does not provide much useful information for the improvement of the quality of the undergraduate experience at an institution.

The third approach is to define quality in terms of the effects of college upon students' cognitive and affective development [2, 13]. Consequently, the greater the impact a college has on its students in the desired direction, the higher the quality of the institution. What is measured is the "value added" from the time students start their undergraduate education until it is completed. Under this approach an institution that attracts students with low SAT or ACT scores and does very well in improving their skills may, in fact, be doing a better job than an institution that attracts high ability students but does not change them as much during their undergraduate years.

Although the outcomes or "value-added" approach is rooted in a concern for the education of students, the acquisition of usable information for institutional policy from this perspective on quality is somewhat problematic. A rigorous determination of the effects of the college experience on student cognitive and affective development requires attention to numerous methodological issues. These issues are reviewed in *College Student Outcome Assessment: A Talent Development Perspective* [17]. The crux of these concerns is that there is a need for careful control of rival hypotheses to the hypothesis that attending a particular college has a unique influence on the attainment of various student outcomes.

Moreover, outcomes are usually assessed using either standardized or locally developed tests to measure cognitive and affective student outcomes. Standardized and locally developed tests, however, have limitations that curtail the usefulness of the outcomes approach to the improvement of practice. There are three limitations to standardized tests that raise difficulties. First, the relationship between curriculum content and test content is often weak. Pike [25] reports that only 30% of one institution's general education curriculum is addressed by items on the ACT-COMP Test, a frequently used test of general education. Another problem is that standardized tests have limited potential to assess such outcomes as problem-solving and higher-order thinking. A third limitation is the strong possibility that without the incentive of a course grade, students may not be motivated to perform well on such tests.

Locally developed tests to measure institutional cognitive and affective development may overcome the first two of these limitations, but the construction of such tests is difficult because of the lack of faculty time, commitment, or expertise to develop sophisticated local tests [12].

An Alternative Definition of Academic Quality

The traditional approaches to delineating the academic quality of an undergraduate academic institution present problems of definition (finding agreed upon criteria), measurement (measuring the performance of these criteria in a reliable manner), and usefulness (formulating feasible institutional policies based upon such measurement). An alternate approach to defining academic quality focuses on fundamental course-level academic processes and describes the quality of such processes in terms of the level of academic demands or rigor expected of students [9]. The types of questions faculty ask students during class, the nature of term papers or other written exercises, and the type of examination questions written by faculty are examples of such processes. Academic demands or rigor is defined through the level of understanding of course content to be demonstrated by students while engaging in course-level processes. Levels of understanding range from a student's ability to recall or recognize course content (knowledge-level) to the use of external or internal criteria to assess the value of course content (evaluation). The level of understanding of course content can be both established and appraised by applying a scheme such as Bloom's [6], *Taxonomy of Educational Objectives: Cognitive Domain* to classify course-level academic processes. Bloom's *Taxonomy* provides a detailed, technical vocabulary for defining academic quality [9]. This well-known taxonomy is composed of six major categories: knowledge, comprehension, application, analysis, synthesis, and evaluation. Because these categories represent a hierarchy of increasing levels of understanding, a course-level process that requires a knowledge-level understanding of course content is less demanding than one that requires an analysis-level of course understanding. The definitions of these levels of understanding are displayed in the Appendix.

Limitations to the three traditional approaches are overcome by this alternative definition of academic quality. Unlike·the reputational approach, it does not require outside evaluators who may not be using the same criteria for assessment and do not have reliable evidence for their assessments. Moreover, it does not require the acquisition of large amounts of additional resources to increase quality because course-level academic processes are day- to-day activities of most college and university faculty. This proposed approach also does not require rigorous control of rival hypotheses like the "value-added" or outcomes approach. Moreover, it does not require the use of standardized tests that assess cognitive or affective development. The problems presented in the construction of such tests therefore are not of concern in the application of this method of addressing quality. Finally, this perspective is not dependent on student motivation for its usefulness.

Some measure of construct validity for this approach to define academic quality is provided by the findings of research by Braxton and Nordvall [9]. To test the assumption that more selective institutions do have higher academic standards, Braxton and Nordvall collected examination questions from faculty in four academic disciplines — biology, chemistry, history, and sociology — at liberal arts colleges of two categories of undergraduate admissions selectivity (Liberal Arts I and II of the Carnegie Classification of Institutions [11]). The collected examinations were classified by two trained coders into various categories of Bloom's Taxonomy. A pattern of differences between more and less selective liberal arts colleges was found on the level of understanding of course content tapped by course examination questions above and beyond the influence of academic discipline, course level, and whether the course was intended for majors or nonmajors. Examination questions requiring a recall or recognition (knowledge level) of course content are asked more often at less selective liberal arts colleges, whereas questions requiring a higher-order level of understanding of course content are asked more frequently at the more selective liberal arts colleges. The findings of this research must, however, be assessed within the context of the general literature about Bloom's Taxonomy that is discussed below in the section on *Application Issues*.

Given that construct validity for this approach is evidenced in differences between more and less selective liberal arts colleges, one is prone, at first glance, to posit that an absolute criterion for defining the academic quality or rigor of course- level academic processes in colleges and universities is provided by this continuum: processes requiring more sophisticated levels of understanding are of higher academic quality. However, quality may also be defined as the optimum match between the level of understanding of course content expected and student ability as well as the goals of instruction. Thus, a less selective institution that requires its students to work up to the maximum level of their abilities may in fact have more quality than a more selective institution that provides courses that are somewhat more difficult but do not require students to perform to the maximum level of their abilities.

In developing an optimum match, the level of understanding expected should be challenging, but not so challenging that students lack the psychological support they need to meet course expectations. The notions of challenge and support undergird many theories of student growth and development [30]. Without an optimal mix of challenge and support, student growth and development is unlikely to occur [27].

Toward Usable Knowledge for Improvement

Unlike the three traditional approaches to defining academic quality, usable knowledge for the improvement of the quality of the undergraduate college experience can be gained by the application of the posited approach. To elaborate, course activities such as examinations, questions asked by faculty in class, and student written exercises are currently embedded in most undergraduate courses. Accordingly, a knowledge of the level of understanding that is being addressed by various course processes can yield usable knowledge for the improvement of the quality of the undergraduate experience. If faculty members use course processes that provide a knowledge level of course understanding, but they are actually seeking a higher level of understanding of the materials, then the questions that are asked and the work that is assigned in the course can be adjusted to prepare students for that higher level. Consequently, the quality of these processes would be improved by adjusting the required level of understanding.

This approach can also be used for academic course features beyond examination questions, such as written assignments or oral questions asked in class. Examination questions and written assignments can be evaluated to determine the level of understanding that they require. Thus, the evaluation of these processes provides more objective knowledge about the "quality" of individual courses than do student evaluations, which inevitably reflect some element of the different expectations among students for the course.

Colleges and universities interested in applying this approach to defining academic quality should begin by conducting reviews of the level of understanding of course content being tapped by various course-level processes in selected academic departments. Such information could be collected as a facet of ongoing academic program reviews. After determining the current level of understanding that is demanded, academic policy could be implemented to encourage increments in the rigor of course activities if deemed necessary. Such academic policy would endeavor to adjust the level of academic standards and undergraduate instruction by requiring an appropriate level of course understanding to be manifested in course-level academic processes. The appeal of this approach is that academic standards can be raised in most colleges and universities by demanding a higher level of understanding of course content. The level of understanding — application or higher-order — sought could be a function of the academic ability of enrolled students and the goals and the mission of the institution. Moreover, increments in quality could be accomplished with a minimum of additional resources. Nonetheless, systematic review of course-level processes is a necessary first step toward the acquisition of usable knowledge for the improvement of the quality of undergraduate education.

Application Issues

Before applying Bloom's Taxonomy in the context of instructional improvement, colleges and universities first need to consider some general questions that have been raised about the validity and usefulness of this scheme. Next they need to consider specific applications issues within the higher education context.

General Validity and Usefulness of Bloom's Taxonomy

The validity and usefulness of Bloom's Taxonomy have been extensively analyzed and studied both in the broader terms of general developments in learning theory and in the more narrow terms of the taxonomy's own presuppositions and categories. Rohwer's and Sloan's review of the taxonomy from five different perspectives in learning theory is an example of the broader type of analysis [28]. They see the cognitive science perspective as currently dominant. This perspective could support the concept of taxonomies of educational objectives, but such taxonomies would differ from Bloom's in that they would be domain specific, they would not necessarily be hierarchical in all domains, and they would allow for the transfer and generalization of knowledge only within specific domains. Having conducted this analysis, Rohwer and Sloane note, however, that Bloom's Taxonomy was not developed to fit the behavioralist theory that was dominant when the taxonomy was created. Its authors probably would not modify it simply to make it consistent with the most accepted learning theory today. They see the authors of Bloom's Taxonomy as driven by a "vision of what constitutes education for productive learning" [28, p. 62].

Many researchers have investigated the validity of the hierarchical structure of the taxonomy. One question that is addressed is the extent to which different judges categorize the same test items as belonging to the same category in the taxonomy. A problem here is the prior learning that students bring to a question. For example, students in a class that has reviewed sophisticated arguments on a topic may be able to answer through mere recall a question that seems to require evaluative prowess. However, even assuming that the answer to a question that appears to call for something beyond mere knowledge — for analysis, synthesis, or evaluation — does, in fact, require one of these higher processes; which one does it require? Judges of test questions do not always agree on which of the three higher order categories a question belongs to. Because research has questioned the rank and operational independence of the categories of analysis, synthesis, and evaluation, it has been suggested that these should be collapsed to form a fourth category, which might be labeled "higher-order thinking." Such a consolidation should lessen the disagreement among those who categorize items according to the taxonomy. Even without such a modification, studies indicate that if raters are extensively trained before classifying items, the level of agreement among them increases [19].

However, assuming that those who categorize test items do agree on their classification, do students encountering the item display the specific mental processes indicated by the classification? And are these processes hierarchical? Obviously not all the questions at lower levels are easier than those at higher levels. It is easier to evaluate the effectiveness of the United Nations than it is to recite from memory the complete United Nations Charter. Putting this complication aside, do students in general perform better on questions at the lower levels of the taxonomy and then encounter increasing difficulty as the questions move to higher taxonomic levels? Here too the evidence is varied. Different researchers reach different results using different methods of statistical analysis. Later studies do seem a little more favorable to establishing the hierarchy as set out in Bloom's Taxonomy. What is clear is that, despite the disagreement among those who test the validity of the Taxonomy's hierarchical structure, educators continue to find it to be useful in describing what they do in the classroom [19].

A main limit, however, on this usefulness is that the taxonomy does not provide guidance to teachers on how to fashion classroom activities to meet its educational objectives [1, 29]. This has been seen as an issue ripe for faculty development efforts based upon the application of the taxonomy [33].

In summary, the research on the validity of the taxonomy is inconclusive, but it continues to be a vibrant educational construct that makes sense to teachers and thus, if properly applied, holds out the hope for improvement in the results of their teaching.

Application Issues at the Higher Education Level

To render this approach useful to practice, several issues need to be addressed by college and university faculty and administrators who are interested in applying it. These issues do not pose the types of near intractable difficulties inherent in the three traditional approaches to the definition of academic quality. In contrast, they are resolvable through faculty and administrative collaboration. These issues obtain at the level of the institution, the academic department, the course, and the individual faculty members.

Institutional level. The goals of a given college or university may determine the appropriate level of understanding that is expected. Application of course content may be the instructional goal in comprehensive colleges and universities [14], whereas analysis and synthesis (critical thinking) may be the goal in liberal arts colleges [34].

In addition to goals, undergraduate admission selectivity may also be a determining factor. Research suggests that performance on questions that plumb synthesis and evaluation is dependent on student general academic ability, whereas student achievement on the other four categories — knowledge, comprehension, application and analysis — is dependent on previous learning and experience [21]. Thus, there may be an upper limit to the level of course understanding — analysis — required by less selective undergraduate institutions. Nevertheless, the level of understanding expected should not only be challenging, but should also be accompanied by psychological support.

Determining the proportion of courses that meet the desired level of understanding of course content set by institutional policy is another application issue at the level of the institution. The targeted level of understanding cannot be achieved in all courses (see issues below), consequently a realistic academic policy should specify an optimum percentage of courses.

Department level. Academic disciplines, which are usually housed in academic departments, also differ in their level of expectations for course understanding [10]. Instruction in disciplines that have a high level of consensus on theory and methods (e.g., chemistry) involves the learning of theories through their application [20]. Application is emphasized in laboratory exercises, lectures, and textbooks. In contrast, critical thinking (analysis and synthesis in Bloom's schema) is more likely to be emphasized in disciplines with various theoretical perspectives (e.g., history, sociology).

However, the meaning of critical thinking may also differ across academic disciplines [4, 22, 32]. If such differences exist, then either levels of understanding other than analysis and synthesis in Bloom's Taxonomy or a different schema will have to be used.

Course level. Within an individual course, the determination at this level may not only be based upon the average academic abilities in the course but also on the needs to accommodate the range of student abilities within the course. If this range becomes very large in an individual course, the determination of the level becomes a serious problem. Moreover, different sections of the same course may also have a range of academic abilities. The institution then needs to face the issue of offering a range of courses that respond to the differing ability levels of its students and then placing students in appropriate courses.

The application of grading criteria and the awarding of grades that correspond to the expected level of course understanding required by assignments are further issues to consider. Do grading criteria reflect the desired level of course understanding? Does the awarded grade signify the attainment of the desired level of understanding? Should a grade of "C" be awarded if the level of understanding required is satisfactorily attained by a student's response to an examination question or to a directed written assignment? What do grades of "A" and "B" represent if a grade of "C" indicates a satisfactory understanding of the course content at the desired level of understanding?

Individual faculty member. The implementation of this approach is fully dependent on the ability of college and university faculty to write examination questions and to devise other course-level academic processes. Techniques for the development of course examination questions and/or course-level processes could be required course work for graduate students aspiring to academic careers and could be included in training programs for graduate teaching assistants.

Familiarity with such techniques could also be the focus of programs of faculty development. Workshops for regular faculty members could include exercises for fashioning questions of appropriate rigor and for improving instructional technique so that students are prepared to answer such questions. If, for example, it is determined that many course processes are demanding a knowledge level of course understanding but a faculty member is actually seeking a higher level of effort, then the faculty member should ask questions or assign written work that exacts a higher level of understanding. Some faculty may require assistance in crafting class questions, examination questions, and other such activities that require a higher level of course understanding. Such assistance is the province of instructional and faculty development offices.

A problem may arise because of faculty resistance to intrusion into academic processes at the individual course level. Except where there are multiple sections of the same course that use a common syllabus, the determination of course academic processes has usually been within the control of the individual faculty member. Thus, if an institution wishes to address the issue of quality at the level of the individual courses, it must find a way to get individual faculty to endorse this approach. What faculty may find attractive about this approach is that it defines quality in terms of something that is within their control, unlike the average qualifications of admitted students, number of books in the library, or institutional endowment. This approach affirms that what happens in the classroom is the most important factor in the determination of institutional quality.

Further Implications for Practice

Like the "value-added" approach to defining quality, much of the current interest in assessment focuses on cognitive and affective outcomes of undergraduate instruction. However, the various limitations of a value-added approach strongly suggest that the focus of some assessment activities should be shifted to the instructional process [8]. Thus, instructional methods and course-level academic processes should be appraised in a systematic way. Through such assessments, information useful to the improvement of undergraduate education can be acquired. Academic affairs officers, institutional researchers, and assessment coordinators are strongly exhorted to design assessment activities that focus on day-to-day course-level processes. Such a focus would constitute an evolution in the assessment movement from accountability of outcomes to the improvement of the quality of undergraduate education [9].

Although this approach to assessing quality focuses on academic processes rather than outcomes, it, nevertheless, is based upon the premise that these processes strongly affect student learning, an assumption that is grounded in both research and anecdotal evidence [23, 24]. This evidence indicates that course examinations greatly influence how students study and, in turn, what they learn. Consequently, higher-order thinking skills are not likely to be developed unless the academic processes in the course are aimed toward the development of such skills and the assessment of learning in the course tests the development of such skills.

However, an alluring assumption that might be made is that a change in process will result in a change in student outcomes. Such an assumption is quite problematic if it requires the assessment of outcomes at the institutional level, an approach that presents some of the difficulties already described in this article. At the level of the institution, the assessment of critical thinking is particularly vexing. First, the definition of critical thinking represents what Baird has called a "conceptual swamp" [4, p. 39]. Without consensus on the definition of critical thinking, it is difficult to measure it. Consensus on such definitional matters at the institutional level are particularly difficult to obtain. A second problem is that academic disciplines may vary in their meaning of critical thinking [22, 32]. Thus, a singular kind of critical thinking may be unattainable [15]. Different instruments would need to be developed for different academic disciplines. A third difficulty pertains to the choice of response format for instruments: multiple choice and essay. Complex cognitive processes can be assessed using the essay format [16]. However, the scoring of essays is difficult [4]. In contrast, the multiple choice format provides for easier scoring, but a restricted range of critical thinking skills can be appraised by this format [4]. For institution-wide assessment of critical thinking the multiple choice format would be the choice of many institutions, because it is easier to score than the essay format.

These difficulties strongly suggest that the pitfalls of changing course-level academic processes to change cognitive outcomes should be avoided as a form of institutional action for the near term. Nevertheless, we encourage scholars to pursue a possible empirical linkage between course-level academic processes and higher-order cognitive development and to confront some of the vexing problems outlined above.

Concluding Thoughts

We offer three closing thoughts. First, a focus on the quality of course-level academic processes does not imply that the content of a course is unimportant to the definition of academic quality. A concomitant defining factor of academic quality is the coverage of essential topics pertinent to a given course. For example, a course on theories in sociology could be considered to be of lower quality if it neglected the coverage of such theorists as Durkheim and Weber. Likewise, a survey course in U.S. history would be of diminished quality if it neglected coverage of the War of 1812.[1]

Second, although this alternative approach to defining academic quality is posited for application at the level of the college or university, it can also be used to delineate quality at the department and course level. Thus, academic departments as well as individual faculty members can use this approach to adjust expectations for student understanding of course content.

Third, the alternate approach to defining academic quality advanced herein is perhaps closer to the value-added approach to quality (effects of college upon cognitive and affective development) than it is to the reputational or resources approach. It seeks to find a kind of "value added" that can be measured as the direct effect of classroom academic processes without invoking the full range of difficult issues that accompany the question of how the college experience in general affects students' cognitive and affective development. Those who seek to rank institutions numerically will probably still use the reputational or resources approach, but those who seek to improve an institution's quality as reflected in the education of its students would do well to consider an emphasis on academic course processes, which are more easily changed than reputation or level of resources. Such an emphasis might be achieved by asking: "What is the best approach to instruction for our students?" rather than "What can we do to impress outsiders who seek to rank our institution?"

Appendix

Descriptions of the six major categories of Bloom's Taxonomy of the Cognitive Domain are as follows [6]:

1. *Knowledge.* This level of understanding is characterized by remembering course content, either through recognition or recall.
2. *Comprehension.* This level of understanding is characterized by the ability to understand the meaning of course content. This ability is manifested in the student's ability to: (1) translate material from one form to another (words to numbers), (2) explain or summarize course material, and (3) predict consequences or effects from course material.
3. *Application.* The ability to use or apply course content to real situations, where solutions are not specified, or to situations the student has not encountered in the course characterize this level of understanding.
4. *Analysis.* This level of understanding is marked by the ability to subdivide course content as well as to discern the organization and the relationship of the parts.
5. *Synthesis.* This level of understanding is characterized by the ability to recombine course content so as to create a pattern or structure not evident in extant course content.
6. *Evaluation.* This level of understanding entails the use of internal or external standards to assess the value of course content.

Notes

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The Higher Education Act of 1992

Skills, Constraints, and the Politics of Higher Education

The 1992 reauthorization of the Higher Education Act (HEA '92) is a case study in the consequences of an incremental and fragmented federal policy-making process. HEA '92 is important because it authorized what by now is more than three-quarters of all financial aid available to students enrolled in postsecondary education in the United States (College Board, 1993). And the politics of HEA '92 are important because they resulted in a significant shift in federal policy from an historic commitment to promote access to postsecondary education through grants based on need to a broader strategy of insured loans regardless of family income.

The policy reorientation culminating in HEA '92 reflects the fragmented institutional structure and pluralistic civic culture of the American political system. Incremental decision making means that only unusual coalitions can produce policies that deviate significantly from the status quo. Similarly, the uneven distribution of resources means that only exceptional conditions can produce and maintain policies like need-based grants, which reallocate wealth to the disadvantaged. Such unusual coalitions and conditions simply were not present in the reauthorization of HEA '92. Shifts in the relative power of influential actors and constraints in the political, economic, social and intellectual environment surrounding HEA '92 prevented the mobilization of forces strong enough to stem the moderating tide. Figure 1 tells the story at a glance: the already widening gap between grants and loans increased exponentially with the adoption of HEA '92.

In their study of the important 1972 amendments to HEA, Wolanin

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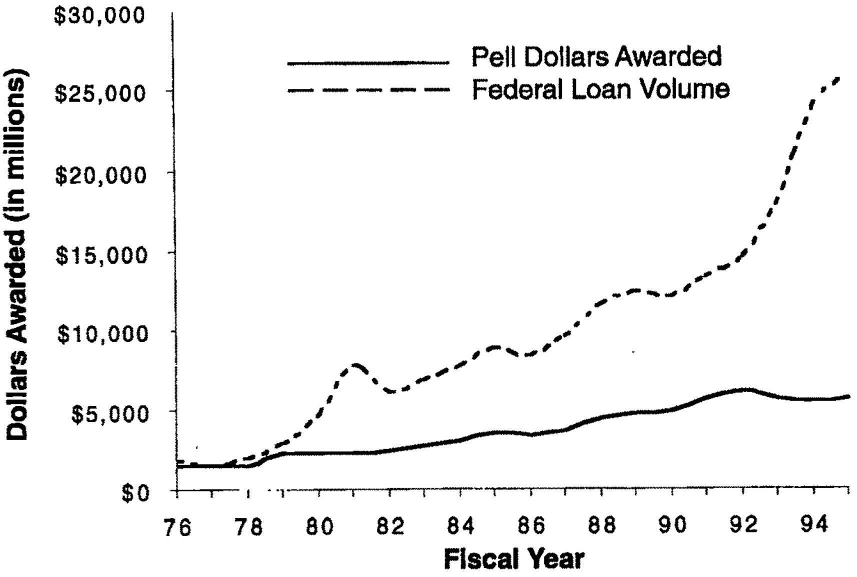

FIG. 1. Impact of HEA '92 on the Imbalance between Grants and Loans: Federal Loan Volume and Pell Grant Dollars

Sources: ACE/DGR based on data from Loan Programs Data Books, Pell Grant End-of-Year Reports, and unpublished data from U.S. Department of Education. *Higher Education and National Affairs*, 26 September 1994, p. 1.

and Gladieux (1976) characterized the higher education policy process as "incremental in three senses: It occurs within the limits of a slowly evolving political culture; it is built on and related to existing policy; and it draws from existing policy models." Within this evolutionary process, specific policy outcomes are shaped by the "skills and intentions" of key participants and the "constraints and crosscurrents" of the political environment in which they work" (pp. 257, 265). The reauthorization of HEA in 1992 reaffirms this incremental and environmentally and politically constrained decision-making pattern.

The first section of the article reviews the conditions necessary for producing and sustaining significant policy change in the federal policy process. The second section uses the history of HEA to illustrate the rise and fall of such conditions in the evolution of higher education financial aid policy. The third section outlines how the "constraints and crosscurrents" of the political environment and the "skills and intentions" of principal actors led to HEA '92's specific policy outcomes. A final section speculates on the future.

Based in Washington D.C. in the Fall of 1992, I was fortunate to have the cooperation of a number of key HEA participants, interviewing more than fifty Congressional staff, higher education association lobbyists, Department of Education and White House officials, and policy consultants who were directly involved in the reauthorization process. I asked them to talk about the critical steps, issues, and players whose positions were included in the final bill and why. Approached when events were still fresh, they provided documents and eye witness accounts that greatly enriched my understanding and gave me a new appreciation of the power of ideas and environment as well as individual action on shaping policy options. I filled out the story from an online legislative history (Legi-Slate, 1992), House, Senate, and conference committee reports; tracked HEA'92 through releases of *Education Daily* ("The education community's independent daily news service"), and association newsletters (e.g., American Council on Education's *Higher Education & National Affairs*); and worked from special studies and reports prepared by the Department of Education, Congressional committee staff, and higher education associations. The responsibility for the version here, of course, is my own.

The Higher Education Act was initially passed in 1965 as an omnibus bill authorizing a variety of institutional, student, and programmatic aid programs for higher education. It was substantively amended in 1972 and reauthorized in 1980 and in 1986. By 1992 HEA accounted for 74% of all financial aid available to students enrolled in postsecondary education in the United States, thus making it perhaps the single most important piece of legislation affecting higher education (College Board, 1992). In terms of total outlays, the federal financial support for higher education is shared between grants for university-based research and allocations for student financial aid programs. For FY 92, federal funding for university-based research totaled $15.7 billion, authorized by dozens of pieces of legislation and administered by at least seven federal departments and agencies (U.S. Department of Education, 1993). By comparison, HEA expenditures in FY92 were more than $18 billion and generated another $14.9 billion in federally insured parent and student loans, all administered by the Department of Education (College Board, 1992).

Approximately 97% of HEA funding is appropriated under Title IV, Student Assistance. For the school year 1991–92, $13.7 billion was lent to more than 4.7 million students enrolled at 8,100 eligible institutions under Title IV's guaranteed student loan programs (GSL) (College Board, 1992). Since its initial passage, HEA has authorized more than $114 billion in loans to 20 million students, with $55 billion outstanding by the time of the 1992 reauthorization (McAdam, 1992).

The other ten HEA '92 titles concern school-college outreach partnerships, academic library enhancement, teacher recruitment and education, foreign language training and international education, construction and improvement of academic facilities, cooperative education, graduate grants and fellowships, postsecondary improvement initiatives (including the Fund for the Improvement of Postsecondary Education), student participation in community service, Indian higher education programs, and the commissioning of studies on various aspects of higher education financing and effectiveness (Schenet, 1992).

Key Elements in the Federal Policy Process

Students of the federal policy process have identified a number of "constraints and crosscurrents" which shape the dynamics of policy making in a given area: the structure of the decision-making process; the number of active participants; the nature of the broader economic, social, and intellectual environment; and the impact of the policy outcome itself all affect the policy result (Ripley and Franklin, 1990; Rourke, 1984; Lindblom, 1989; Lindblom and Woodhouse, 1993; Berry, 1989). Understanding the relationships among these critical factors goes a long way toward understanding the outcome of HEA '92.

Structure. The structural fragmentation of the American policy making process invites wide participation and is open to broad environmental influences. "Countless" sources of influence impact a "highly relative and pluralistic decision-making system characterized by compromise, incrementalism and continual adjustment, yet subject to biases in one direction or the other (Jones, 1984, p. 35). The net result is a policy process that reflects our historical concern with personal liberty rather than effective government and works against policy change: it is easier to get government to desist than to act (Lindblom and Woodhouse, 1993).

Participants. A particular policy outcome, however, reflects the preferences of participants whose political resources at the moment of formal decision — authority, access, constituency, ideas, and strategy — enable them to influence the final choice. Ripley and Franklin (1991) argue that the very openness and "sheer complexity" of the fragmented decision-making process have the ironic result of producing a myriad of discrete public policy arenas dominated by exclusive "subgovernments" composed of the most active players. These subgovernments are made up of individuals who hold senior and institutionalized decision-making positions or are long-term interest representatives. Committed to current policies they helped to devise, they are slow to change, more responsive to special interests than to general interests and to the privileged than to the underprivileged.

Berry (1989) believes that the recent "advocacy explosion" of interest groups, the continuing decentralization of congressional decision making, and increased politicization of executive branch offices could transform exclusive subgovernments into more pluralistic issue networks. Such transformations, however, will not necessarily challenge the incremental and conservative mode of the end result. "Upper- and middle-class interests," Berry concedes, "will always be better represented" (p. 195).

Policy process analysts agree that the more a policy area is dominated by a small group, the more that significant policy change requires an "intense commitment of political leadership," usually from outside the circle of currently active participants and supported by a broad national consensus. The president, his key policy staff, and his political appointees in the responsible agency, occasionally joined by members of congress outside the dominating policy circle (especially those seeking a national constituency), participate sporadically but are more likely to be the ones to propose substantial ideological or programmatic policy change. Mobilized as ad hoc coalitions and driven by ideological or program commitments, these forces for change face strong opposition from the more institutionalized and specialized participants who support current policy (Ripley and Franklin, 1991).

Environment. Lindblom and Woodhouse (1993) usefully remind us that, whoever the formal participants (referred to as "functionaries" in their analysis), they "often serve as lenses through which are refracted diverse pressures, ideas, questions, problems, and policy options, emanating directly and indirectly from countless sources" (p. 4). Thus any study of policy making should pay equal attention to broader influences, including the limits of human reasoning, the tension between analysis and power, the special role of business, and the extent of socioeconomic and political inequality in American society. The state of the economy, political power, social demands, and public ideas significantly direct policy choices.

Policy Issues. The nature of the policy issue at stake has its own conditioning impact on the policy process. Redistributive policies that transfer value to the less advantaged at the expense of the more advantaged require the convergence of significant forces (Ripley and Franklin, 1991). The initiation of basic "educational opportunity" grants for postsecondary students "with exceptional financial need" in HEA '65, for example, required presidential leadership, congressional support, a broad national constituency in the "war on poverty," the momentum of the civil rights movement, and a growing economy that could afford redistribution.

The political energy necessary to create such redistributive policies is seldom sustained. Gradually the more institutionalized forces, buttressed by external pressures for more widely distributed government subsidies, spread the wealth more evenly; grants are minimized and loans expand and the transformation of HEA '65 to HEA '92 is complete.

History of the Higher Education Act

HEA 1965. When HEA was initially adopted in 1965, the Democrats controlled the White House and Congress and had mobilized public support for dramatic changes in domestic policy on behalf of "The Great Society." Overshadowed by Medicaid, the Voting Rights Act, and the Elementary and Secondary Education Act, HEA was passed with little debate and signed by President Johnson at his alma mater, SW Texas State College, in November 1965. Incremental even then, HEA '65 brought together a variety of existing student aid programs designed to meet earlier national educational needs. The federal work-study program, for example, began during the Depression to help students pay for college; the 1944 GI Bill allowed returning veterans to continue their education and met twin national goals of obligation and economic development; World War II produced a student loan program in disciplines with manpower shortages; the National Defense Education Act (NEA) of 1958 provided grants and loans to students in education and the sciences as a national defense response to Sputnik; and President Kennedy introduced what became the National Education Facilities Act of 1963 to help universities cope with the resulting enrollment boom.

Even the issue of access for low income students was not new. President Truman's 1947 Commission on Higher Education had issued a stirring challenge to make "Equal education opportunity for all persons . . . a major goal of American democracy." Reaffirmed by a similar Eisenhower administration study, the goal of equal opportunity foundered on old debates over redistribution from state to church, public to private, and rich to poor. Struggling to control the growing civil rights movement, President Kennedy proposed need-based grants in the name of "equal opportunity" in 1963, but his ideas were dropped in the Senate over old concerns about redistributing funds from rich to poor and from public to private institutions (House Report, 1992; Wolanin and Gladieux, 1976).

By 1965, however, the players and the environment had shifted. Concerns about redistribution were swept away by recasting the issues of equal opportunity in terms of civil rights and the national war on poverty. Congress followed President Johnson's lead in launching a variety of efforts to make it possible for able students from disadvantaged backgrounds to go to college. Franklin and Ripley argue that the enactment of general-purpose aid for needy students was possible because "the redistributive focus was shifted away from race and religion to poverty; and the distributive features were emphasized" (Franklin and Ripley, 1991, pp. 144–147).

Written as an omnibus bill authorizing a number of separate programs (an efficient way to make policy in a highly fragmented system and to "hide" redistributive initiatives in a string of more acceptable distributive programs) promoting access to higher education, HEA '65 inaugurated new federal "educational opportunities grants" for students "with exceptional financial need" along with a number of more familiar student aid programs. HEA '65 made work-study a permanent part of federal higher education policy, created a federally subsidized Guaranteed Student Loan (GSL) program for families with moderate incomes, and incorporated Upward Bound from the Poverty Program to recruit and support needy minority students (Wolanian and Gladieux, 1976; McAdam, 1989).

1972 Amendments. The access goals of HEA '65 were strengthened through various enhancements in the late 1960s, culminating in the far-reaching 1972 Amendments. HEA '72 established equal opportunity as the principal focus of federal policy toward higher education, thereby deciding the long debate over institutional versus student aid in favor of students. The '72 Amendments created a system of federally funded Basic Educational Opportunity Grants (BEOG), to be supplemented by matching State Education Opportunity Grants (SEOG), to assure every able and needy student a set amount of aid to help meet college costs.

The 1972 Amendments kept HEA'65's need-based work-study, BEOG, and GSL loan programs and chartered the Student Loan Marketing Association (Sallie Mae) to purchase current GSL's in order to generate more student loan capital. "Postsecondary education" was expanded to include noncollegiate career preparation and occupational education offered in community colleges and proprietary institutions. Other significant '72 initiatives included attempts to hold higher education more accountable as federal support increased. Reform efforts included the Fund for the Improvement of Postsecondary Education (FIPSE), requests for better information bases on higher education finance in the Department of Education, and requirements for uniform institutional accounting standards (Wolanian and Gladieux, 1976).

HEA '72 ushered in a decade of Democratic control in Congress and bipartisan support for education in the White House. The result was a steady expansion in both eligibility and participation in federal student aid programs. Amendments expanded loan eligibility, increased federal insurance guarantees, renamed the BEOG in honor of its original sponsor, Senator Claiborne Pell (D-RI), extended eligibility to all needy full-time and part-time undergraduates, supported the creation of state loan guarantee intermediaries, raised loan limits, and created new parent loan programs. The momentum culminated in President Carter signing the Middle Income Assistance Act of 1978, which essentially removed income as an eligibility requirement for federally subsidized loans for postsecondary education (McAdam, 1989).

HEA in the '80s. The 1980s, however, inaugurated a new phase of federal-higher education relations reflecting divided partisan control in Congress and an antieducation stance in the White House. The end of the decade added a preoccupation with the growing federal deficit. Democratic supporters of HEA in Congress worked to focus the 1986 reauthorization on minor points of implementation in fear of White House intervention if access issues were emphasized. The 1986 HEA Reauthorization and Budget Reconciliation Acts in 1988 and 1990 raised loan limits and interest rates, but also reinstituted income caps for GSL, tightened loan disbursement and collection procedures, and added restrictions on students, lenders, and institutions to deal with the alarming increase in defaults. The 1988 Amendments renamed the GSL program for Senator Robert Stafford. And the 1990 Budget Enforcement Act further restricted expansion by requiring "pay-as-you-go" provisions for any new direct spending proposals (McAdam, 1989; Schenet, 1992). Preparation for the 1992 HEA reauthorization, therefore, began with a legacy of access compromised by a decade of divided political power, antieducation sentiment, and more severe budget restrictions.

Goals for HEA'92. Representative William D. Ford (D-MI), chair of the House Labor and Education Committee, reassumed the chair of its Subcommittee on Postsecondary Education in preparation for his fourth HEA reauthorization in January 1991. In a speech to the Coalition of Higher Education Assistance Organizations later that month, he told his audience that since the last major changes in 1972 "(HEA) programs have grown and evolved without a clear plan or logic. Today they are less like a carefully integrated and well balanced structure and more like a coral reef, a convoluted mass that has grown by accretion" (Ford, 1991).

Not only had HEA lost its integrated design to "accretion," Ford contended, the aid program had also lost its original purpose. As conceived in 1965 and reaffirmed in 1972, HEA's financial aid programs were intended to provide access to postsecondary education for all Americans "with the talent and ability to benefit" through a system of grants for financial needy students and loan subsidies for students from families with moderate incomes. Over the last twenty years, however, rising college costs, expansion of eligibility, enhancement of loan programs, and flat appropriations for grant programs had combined to shift federal support from direct grants to loan subsidies.

The goal for 1992, Ford hoped, was "a thorough reexamination of all the (HEA) programs" with the goal of "enhancing postsecondary educational opportunities for Americans." He called for participants to "put everything on the table and make major and fundamental changes where they are called for." Well aware, however, of the center pull of the normal policy-making process, Ford recognized that "we have only been able to make major changes and major advances in higher education policy when the congress and the administration work in cooperation and partnership." It would take "a major reauthorization initiative from the Administration" to mount such an effort (Ford, 1991).

This article is about why that did not happen. Not only did HEA '92 result in further "accretion," the new layers continued to move HEA further from its redistributive legacy of access for needy students toward a distributive policy of subsidy regardless of income (Jennings, 1993).

"Crosscurrents and Constraints" for HEA '92

The 1992 Reauthorization Agenda

The nature of the policy issues on the 1992 reauthorization agenda, particularly their distributive or redistributive options, shaped the process and constrained the outcomes. House and Senate subcommittee leadership and staff began preparing the 1992 HEA agenda as soon as the 1986 reauthorization was completed. Speaking and writing at higher education conferences and in journals and newsletters, key Hill players publicized their agendas and their preferences. In the spring of 1989, key participants — such as the American Council on Education (ACE), the Department of Education (ED), the National Association of Student Financial Aid Administrators (NASFAA), the federal Advisory Committee on Student Financial Assistance (ACSFA), and the National Council of Higher Education Loan Programs (NCHELP) — initiated extensive internal processes for developing reauthorization proposals. Representative Pat Williams (D-MT), then chair of the House Postsecondary Education Subcommittee, began the formal public preparation phase by calling hearings in the spring of 1990 to identify major issues and policy options.

The issues for the 1992 reauthorization were generated by the impact of earlier HEA provisions on a shifting social, economic, and political environment. College costs grew at a rate that outpaced inflation; Pell grant allocations were virtually flat; and the participation of students enrolled in proprietary schools in the GSL program increased five times. One consequence was a significant decline in the ability of low and moderate income students to attend college without incurring considerable debt. Another was evidence of substantial fraud and abuse in the GSL programs. Real growth in enrollments during the period also meant growth in all federal aid programs, although with only moderate improvement in minority participation. Complaints about the complexity of aid application and administration processes amplified. Rising costs effectively squeezed out many moderate income students who could neither meet existing needs tests or afford to pay outright. At the same time, increasing costs devalued the Pell grant for low-income students, further restricting access (Schenet, 1992).

By the time Representative Ford reassumed the chairmanship of the Subcommittee on Postsecondary Education in January of 1991, the higher education "issue network" already shared a consensus about what the major reauthorization issues would be in 1992: the grant/loan imbalance; the needs of middle-income and working families; abuse and default rates in student aid and loan programs (referred to as "program integrity"); the aid application process; and efforts to attract more disadvantaged students to college (Johnstone, Evans, & Jerue, 1990; ACE, 1991; Ford, 1991).

Grant/loan imbalance. As a result of rising college costs and declining federal support during the 1980s, student loans had replaced grants as the dominant form of federal student aid. In the mid-1970s, about 76% of federal student aid was awarded in grants and 20% in loans; by the mid-1980s the proportions were reversed, with 67% going to loans and only 29% to grants. The imbalance was increased by the decline in the purchasing power of the Pell Grant, which had paid 46% of the average cost of attendance at a four-year public college in the mid-1970s, but now paid only about 30%. Combined with the impact of rising college costs, the gap between the annual Pell appropriation and actual costs had widened steadily (Schenet, 1992; College Board, 1992).

Ford's solution was to raise the maximum and make grants an entitlement rather than an annual appropriation; President Bush's initial preference was to raise the maximum and restrict eligibility only to the neediest students. Ford's inability to attract Congressional support for his position and Bush's intransigent opposition to the entitlement concept proved to be one of the most contentious issues that framed the reauthorization debates.

Middle-income students. Rising college costs combined with increasing restrictions on eligibility for federal aid to squeeze out middle-income students who could neither qualify for support nor afford to pay outright. During the 1980s, the average cost of college attendance rose about 45%, median national disposable income increased about 15%, and federal nonresearch aid actually declined (Hartle, 1990; Senate, 1992). Democrats and Republicans alike saw the issue as an opportunity during a presidential election year and proposed a variety of modifications throughout HEA, particularly in expanded eligibility, on behalf of the middle class.

Program integrity. By FY91, Stafford loan defaults had risen to an estimated $3.6 billion a year, more than half of the annual program costs and an increase of nearly $2.5 billion since 1986 (Senate, 1992; CRS Brief, 1992). Earlier warnings from ED's Office of the Inspector General (OIG) had generated rule changes at ED and loan restrictions in the Budget Enforcement Acts of 1988 and 1990. Senator Sam Nunn's (D-GA) Permanent Subcommittee on Investigations released its widely publicized finding that the GSL program was "plagued by fraud and abuse at every level" in the midst of the reauthorization hearings in the spring of 1991.

Proposed solutions varied from eliminating nondegree institutions to increased state and federal oversight. Ford called the elimination proposal sponsored by traditional higher education institutions "class warfare" and turned instead to strengthening the "triad" of regional accrediting bodies, state review agencies, and federal oversight through the Department of Education. Higher education lobbyists initially supported greater state review only to have to return to the Hill to appeal for limitations under pressure from their alarmed constituencies. These late appeals weakened the credibility of traditional higher education groups and compromised their ability to influence other, initially higher priority, issues such as eligibility and needs criteria. The bipartisan consensus generated by the Nunn Hearings and continuing default reports from GAO, however, bent only slightly; the long-predicted first steps toward greater accountability and more federal control were written into HEA '92.

Simplification. The complexity of the layered federal aid program had itself become a barrier. The "free" federal application form was burdened with additional questions and fees; grant and loan programs used different formulas to determine need; and the introduction of state loan guarantors and secondary markets added more fees and levels of oversight. Proposals focused on simplifying the application form, adopting a single needs formula, merging the various grant and loan programs, and eliminating "middle men" such as banks and guarantee agencies.

The application "delivery system" issue generated an emotional debate between the major vendors and proponents of a single, free federal form. Developing one needs formula, within budget limits, generated its own drama, setting factions of the higher education community against each other and ending with vows for further revision in the next Congress. Proposals to merge programs fell victim to more politically visible issues and concerns that the result would be less funding for everyone. Simplifying the loan process became a major issue in itself.

Direct loans. By 1992 the GSL program had been shaped by 19 major education acts, eight major tax bills, and eight budget bills. The result was an elaborate multitiered system involving five kinds of loans, more than 7,500 educational institutions, about 7,800 commercial lenders, 35 secondary marketers, 46 state or nonprofit guarantee or loan services agencies, and ending in innumerable international capital markets. Theoretically the entire system was overseen by the U.S. Department of Education (GAO, 1992). The "direct loan" concept, discussed by various aid and tax groups since the 1970s, was to eliminate everyone but the student, the postsecondary institution, and the federal government in the loan process. Different versions would have students repay through national service, on an income contingent basis, and/or through the Internal Revenue Service (GAO, 1992; Schenet, 1992).

The strongest direct loan proponents included NASCLGU (whose lobbyist led the support campaign), and high profile senators such as Simon (R-IL), Durenburger (R-MN), and Bradley (D-NJ), who attached a version to the 1991 Tax Bill which passed the Senate but failed in conference. Leading House supporters, such as Ford, Petri (R-WI) and Andrews (D-NJ), saw the potential savings as a way to fund grant entitlement and to complement income contingent loan repayment proposals.

Direct loan opponents included lending institutions such as banks, secondary marketers and loan services such as the federally chartered Student Loan Marketing Association (Sallie Mae), and state guarantee agencies whose role would be significantly reduced in the loan process, Senator Pell and his staff who were worried about ED's ability to implement such a program, and, after an initial internal debate that delayed the announcement of an administrative position, President Bush, Secretary Alexander, and OMB. Facing the loss of millions of dollars of fees on essentially no-risk loans, aggressive (some would say strong-arm) lobbying on behalf of the banking industry was effective. Bush's threat to veto HEA over direct loans forced Senate and House supporters to compromise on a pilot; even then, it took a last-minute appeal by House Republicans to get the president to sign HEA in July 1992. Clearly the direct loan debate was just beginning.

The Federal Deficit

The growing federal deficit became the most pervasive constraint on reauthorization, dooming Ford's call for a "thorough reexamination" of all HEA programs and reinforcing demands for stricter accountability. Terry Hartle, then education staff director of the U.S. Senate Committee on Labor and Human Resources (later to become the American Council on Education's senior vice president for governmental affairs, see "incest group" below), warned in *Change* magazine as early as January 1990 that, "The most important short-term economic issue today is the enormous federal budget deficit. . . . Virtually all public policy debates revolve around this issue. Until the deficit is reduced, it will be difficult for the federal government to launch new initiatives (especially nondefense initiatives) or to increase funding for existing policies" (*Change,* January/February 1990, pp. 32–33). With key Democratic leadership and most Republicans concerned about the growing deficit, the 1990 Budget Enforcement Act's "Pay-as-you-go" restriction forbidding new costs without a reallocation of funding became the ultimate standard in selecting policy options during final reauthorization negotiations. Controversial changes, such as Ford's proposal to make Pell Grants an entitlement, and even compromise changes, such as state oversight of Title IV institutions, were rejected or limited on grounds of cost.

Presidential Election Year

A third significant constraint on reauthorization was the 1992 presidential election. Once the process spilled over into 1992 (HEA simply was not a high enough priority item to hold its place on the Fall 1991 Congressional docket), presidential election year themes took precedence. The goal of redressing the grant/loan imbalance in the interest of helping needy students, for example, lost ground to the more politically attractive goal of helping the middle class. Democratic strategists had already decided that the Republicans were vulnerable on the middle-class issue (the Republican sponsored reinstatement of income eligibility for the GSL program in the 1980s was an example). Once the possibility of a competitive presidential election seemed real, both parties made the middle-class theme second only to the budget deficit as an HEA policy criterion. Given this electorally induced consensus, HEA'92 would prove a boon to middle-class students. At the end of reauthorization, Ford actually released a statement listing-middle class benefits.

Although not yet the presidential candidate, Bill Clinton's support for the concept of direct loans and repayment through national service or income contingent schedules was widely known during reauthorization discussions and spurred Democratic hopes and solidified Republican opposition. His ideas also sparked wide national interest, beginning to build the broad national constituency critical for significant policy change to come.

Election year dynamics influenced the reauthorization process as well as policy choices. Following a long election year tradition, for example, House and Senate field hearings on HEA were held in the districts of subcommittee or committee members up for reelection — as much to provide the member visibility as to gather testimony. Timing was also important. Democratic leadership pressured the HEA Conference Committee to complete its work prior to the Democratic Convention scheduled to begin in early June; conference staff worked intensively through April and May; public markup was held 11 June; and the Conference Committee reported on 16 June, right on schedule.

Ford also used the presidential campaign to challenge President Bush's threat to veto the final HEA bill over the direct loan issue. Ford made it clear that if Bush vetoed the bill in July, he would not begin the legislative process again, leaving millions of students without funding when school opened in September and challenging Bush's claim to be "the education president."

Public Attitudes Toward Higher Education

HEA was particularly vulnerable to the crosscurrents of environmental forces such as the budget deficit and presidential year politics in 1992 because of a widespread decline in public confidence in the special status of higher education in the United States. Public questions about why the cost of tuition was rising faster than inflation; extensive media coverage of scandals in college athletics; lurid reports of growing crime on campus; embarrassing revelations about campus uses of indirect cost revenues; confessions of research fraud at prestigious research universities; widely distributed studies showing the decline in teaching productivity; sensational reports of the weak cognitive abilities of graduates; glossy marketing materials bragging about low to nonexistent entrance requirements; emotional public debates on the in-coherence of the curriculum; aggressive media exploitation of "political correctness" on campus; and horror stories about loan abuses and default rates publicized during the Nunn hearings early in the reauthorization process — all generated a significant credibility gap for higher education.

Congress was not immune to this negative press. Rick Jerue, Counsel for the House Labor-Management Relations Subcommittee (and former staff director for the House Postsecondary Education Subcommittee, see "incest group") noted that few members of Congress really understood how higher education institutions work: "Their impressions [are] anecdotal." Members read about athletic abuses in the sports pages and saw them "as indicative of (broader) management problems." The May 1991 reports of universities overcharging for research "couldn't come at a worse time," lamented C. Ronald Kimberling, former assistant ED secretary for postsecondary education and now executive vice-president of a California-based trade school chain, "There's potential for an erosion of public trust in higher education." Such adverse publicity, Jerue concluded, "focuses more attention on colleges and that normally spills over onto major pieces of legislation" like HEA, resulting in increased measures of accountability and funding cuts.

Public Ideas

Several interview sources observed that policy analysts do not give enough credit to Woodrow Wilson's observation that "nothing is so powerful as an idea whose time has come" when they attempt to model the policy process. Reauthorization was no exception. One of the most powerful public ideas affecting HEA '92 was the notion of individual responsibility. The new generation of Democratic leadership joined Republicans in suspicion of "handouts" like grants; welfare reform was in everyone's platform. The idea of government support, "something for nothing," was out; "personal responsibility" and "accountability" were in. Relevant to HEA, Ford and Pell, who had come to power with HEA '65 and the "Great Society," had themselves gone to college on its predecessor, the GI bill. Younger Congressmen and candidates, however, had borrowed their tuition. In the end, Ford could get no more than 135 House Democrats to support the concept of Pell grant entitlement.

Bottom line, the crosscurrents and constraints of the political, economic, social, and intellectual environment worked against those who wanted to restore HEA's commitments to needy students and in favor of those who sought support through a broader constituency. Loans could leverage federal dollars four to one argued those concerned about cost.

Income restrictions meant the middle class itself was effectively being denied access, contended those with an eye to the election. Everyone agreed the process was much too cumbersome. Some, hardened by higher education's public flaws, argued that the inevitable increase in accountability was long overdue. Given this environment, one might argue, the actors had few options.

"Skills and Intentions"

The "skills and intentions" of major actors, however the environmental cards were dealt, determined how they were played. Three major clusters of players were active in HEA '92: (1) a legislative cluster of the relevant congressional authorizing and appropriating subcommittee and committee members and their staffs; (2) an administrative cluster including the president, the Department of Education, the Office of Management and Budget, and the Executive Office of Policy Development; and (3) a loose cluster of affected interest groups including (a) the higher education "community" of associations and lobbying firms representing higher education institutions and programs in Washington, and (b) a coalition of financial organizations, professional associations, and lobby firms whose private and public sector agency members service HEA's student aid programs.

The cast of actors shifted slightly with each issue depending upon whose interests or policy preferences were at stake. By any standard, however, the higher education network in Washington is closely knit, fully qualifying in Lewis's (1977) term as an "incest group." Most of the participants have been involved with higher education policy development and administration since HEA was adopted; many have worked in more than one cluster; and all have strong opinions about HEA options and about each other.

Power shifts, such as the assumption of Republican control of the Senate in 1981 or of Ford's return to the chairmanship of the House Postsecondary Education Subcommittee in 1991, initiated a domino effect: Hill staff move from one education committee to another or out into the lobby world or to ED or to the White House Policy staff. These long-term and shifting relationships heightened the impact of personality and style on the actual conduct of reauthorization and shaped policy outcomes.

Legislative cluster. By all accounts, the 1992 reauthorization process was dominated by the chairs, members, and staffs of the relevant House and Senate authorizing committees and subcommittees concerned with higher education. In both Houses, the positional authority of the subcommittee chairs was further strengthened by long service and used to advocate for specific policy preferences. Ford, for example, had chaired the House Committee on Education and Labor and its Postsecondary Education Subcommittee for three previous HEA reauthorizations. His Democratic colleagues in the House freely confessed that they generally left HEA to Ford, saying that he "always takes care of Democratic interests and never gets us into trouble." Exercising firm parliamentary and personal control over both the committee and its subcommittee, Ford used his position to control the HEA '92 policy agenda and to assure the consideration of his proposals on several key HEA policy issues such as grant entitlement and direct loans.

In the Senate, Senator Claiborne Pell (D-RI) had chaired the Subcommittee on Education, Arts and Humanities since 1968 and bears the distinction of having the basic grant program renamed in his honor. Senator Ted Kennedy (D-MA), chair of the parent Labor and Human Resources Committee, has similar long service and special policy interests, enhanced by his close ties to representatives of Massachusetts' higher education, particularly from his alma mater, Harvard University.

Senate committee chairs have less control than those in the House, and Pell had to contend with a larger number of proposals he did not support from his colleagues with their own interests in higher education. For example, Senator Bill Bradley (D-NJ) joined other senators in supporting direct loans based on a conversation he had with a constituent on the plane home one weekend. (Given the election year dynamics, constituent concerns were to be frequently invoked in the reauthorization debate (Browne and Paik, 1993)). In the face of Pell's opposition, Senators Simon (R-IL), Durenburger (R-MN), and Bradley tried a number of tacks to introduce a direct loan provision. They were not successful. Pell's Labor and Human Resources Committee was able to postpone considerations of direct loan proposals from outside members until after the committee bill was introduced to the full Senate. With the exception of a last minute floor challenge from former Duke University president Senator Terry Sanford (D-NC), who protested language on state oversight, Pell and his staff passed the bill they introduced.

Both Ford and Pell gave their staff directors, Tom Wolanin and David Evans, respectively, significant autonomy to develop initial HEA draft proposals and direct the legislative process. And like their chairmen, both staffers had significant HEA experience and used their positions in support of well-known policy preferences. With only a one-year hiatus while he worked in higher education as executive assistant to the president of New York University, Tom Wolanin served as staff to a variety of House and Senate committees since 1975. Wolanin followed his boss Bill Ford to become staff director for the House Subcommittee on Postsecondary Education in 1978–81, 1985–87, and again since 1991, making HEA '92 his fourth reauthorization cycle.

Wolanin's counterpart in the Senate, David Evans, began his career with Claiborne Pell as a staff member on the Subcommittee on Education, Arts and Humanities in 1978, was minority staff director from 1981–87, and has been majority staff director since then. Evans, in turn, delegated significant authority to Sarah Flanagan, a fellow Rhode Islander whose father founded the state's community college system, for developing the initial Senate draft and seeing the bill through conference. As another example of the "incest" among the Washington higher education network, Evans' first staff job was under Jean Frolicher, majority staff director for the Subcommittee in the 1970s, who came to HEW in 1961 and the Hill in 1966, and who was then executive director of the National Council of Higher Education Loan Programs (NCHELP).

Staff influence is inevitable for a bill as complex as HEA. In his book on the HEA 1972 Amendments coauthored with Larry Gladieux (then a Hill staffer and now with the College Board), Wolanin cautioned against overstating the role of staff: "In both the House and Senate, professional staff members, in varying degrees and in different ways, clearly share in the exercise of power. Yet the constraints on staff influence are equally impressive. Whether in the personal office of a Member or on a committee, a staffer always knows that he serves at the will and in the interest of his principal; that is the most important reality of congressional staff work. The staff member's status as hired help is never forgotten" (Gladieux and Wolanin, 1976, p. 89).

Acknowledging that congressional staff work within limits set by their chairs, many HEA participants nonetheless believe that the 1992 HEA reauthorization was unusually staff-driven. The Senate Subcommittee hearings began in February 1991; the House hearings, in March; both were concluded by May. The task of drafting a bill then passed out of the public eye and into the hands of subcommittee staff, each of which worked independently. There were no further hearings to discuss the resulting Senate draft released in May or the House draft released in late September. Ford and Pell and their staffs believed that this strategy allowed maximum opportunity for the higher education community to present its proposals and yet maintained maximum flexibility for legislators in drafting provisions. Representatives and senators could benefit from extensive input, but did not yet have to defend particular commitments. The wider network, however, resented that HEA was written "in isolation" and blamed the internal contradictions of the final legislation on the resulting piecemeal attack.

The domination of staff continued into the conference process. Of the more than 1,500 differences between the initial House and Senate HEA bills, for example, staff brought only a dozen to the full Conference Committee. The rest were settled in consultation among staff and with key participants in other clusters. More than one participant assured me that no recommendation was forwarded to either subcommittee without Wolanin or Evans' approval and that many final conference decisions were settled between them personally. Participants also commented that the personal lives of key staff members significantly influenced the reauthorization process: the pregnancy of a key Senate Committee staff member and the divorce and then new marriage of a central House staff director set the tone of staff-association interactions and influenced the timing of drafts and hearings.

Administrative cluster. The voice of the administration, so critical in the initiation of HEA in 1965, was weakened in the 1992 reauthorization by turnover in administration leadership, the technical approach and poor reputation of the Department of Education (ED), highly publicized policy differences between OMB, key Republican senators, and White House Policy staff on the issue of direct loans, and conflict with Ford over his grant entitlement proposal.

The extent of participation by ED in HEA reauthorization depends upon the priorities of the president and the secretary. During the 1986 reauthorization cycle, for example, President Reagan's anti-ED stance meant that Secretary Bennett's influence was essentially negative. ED sent recommendations only at the end of the legislative process, and Bennett mounted a barrage of media attention to the issue of student loan abuse (allegedly spent on "fast cars and trips to Florida"). Secretary Cavasos and his successor Lamar Alexander, however, wanted ED to be an active participant in 1992. In 1989, therefore, Cavasos asked Charles E. M. Kolb, then deputy secretary, to chair an internal steering committee to develop HEA recommendations. The steering committee sought broad input by sponsoring regional hearings and put a notice in the Federal Register to invite comment.

How ED organized itself to develop recommendations, however, illustrates why policy so often evolves incrementally. The steering committee organized task groups around program areas, resulting in a focus on technical issues in existing programs rather than proposals for broad policy change. The internal ED steering committee, moreover, suffered constant turnover as Sec. Cavasos left and Sec. Alexander came in; only three individuals in ED remained on the steering committee throughout the reauthorization process.

Once approved by the steering committee and the secretary, the department's recommendations were reviewed by the White House Domestic Policy staff, which the steering committee's initial chair, Kolb joined midstream in 1990, and the Office of Management and Budget. Differences of opinion between these offices, with Secretary Alexander at ED and Dick Darmon at OMB opposed to direct loans and Charles Kolb on the White House Policy staff in support, for example, delayed the formal presentation of the Administration's HEA recommendations and further weakened ED's policy influence.

As a result of its technical approach, ED was successful in winning acceptance of a number of its suggestions, particularly on implementation issues (U.S. Department of Education). ED officials participated in many formal House and Senate hearings and even more informal sessions with Hill staff, particularly on the Senate side, during the drafting and conference process. The technical orientation of staff, however, prevented ED from mounting the kind of sustained involvement necessary to lobby for significant policy change.

The climate of political opinion was an additional handicap for ED. Ford and Pell had both personally and publicly taken ED staff to task for not meeting its legislative responsibilities to implement the 1986 Reauthorization of HEA. Accused of a "dismal record" in overseeing loan programs, ED officers were rebuked in public hearings for making no progress toward creating the student loan data base authorized by the 1986 Reauthorization and further embarrassed by the failure to issue regulations implementing its aid provisions even as the 1992 process got underway. Exasperated Hill staff jumped at the suggestion from the equally frustrated higher education community requiring ED to use "negotiated rule-making" to develop the 1992 HEA regulations in the interest of making the rules more timely and more responsive to user needs. ED staff objected, arguing that "re-neg" was inappropriate. With so many counts against it, however, ED lost, and five HEA titles were opened to negotiated rule-making in the final legislation.

Apart from issues concerning ED, conflict between the Hill and the White House over grant entitlement and direct loan proposals only deepened as reauthorization progressed. Ford had earlier proposed making Pell grants an entitlement to avoid what had become annual underfunding. Indeed, GAO announced during the reauthorization debates in Congress that the Pell Grant program was at least $1.2 billion in debt for FY91. Bush signaled his own Pell solution equally early by proposing changes in the FY92 Budget for ED which would raise grant limits significantly but restrict eligibility to only the neediest students. Ford and the higher education community strongly opposed the Administration position, arguing it would eliminate too many students. One OMB official known for his generally liberal views observed that he was in the unusual position of arguing for poor students on behalf of a conservative Republican administration against the liberal Democratic establishment which supported expanding eligibility on behalf of the middle class. Bush would not support an entitlement; Ford would not support restriction on eligibility. With little congressional support for either, both eventually abandoned their positions to the status quo.

The higher education community. The cluster of associations and institutions that speak for postsecondary education in Washington include associations representing higher education institutions, postsecondary professional staff groups, particular postsecondary service or academic programs, and public and private agencies that service student aid programs.

The most visible higher education presence in Washington is the American Council of Education (ACE) which, at the strong suggestion of Representative Ford, coordinated the 1992 HEA reauthorization recommendations of more than a dozen other higher education associations. ACE, with its diverse membership of public and private, two-year and four-year, research and undergraduate institutions, serves as a "peak association" for a coalition of six major presidential associations known as "the Brethren." Chaired by ACE, the Brethren include the National Association of State Universities and Land-Grant Colleges (NASULGC) and the American Association of State Colleges and Universities (AAASCU), which together covered the four-year public universities; the Association of American Universities (AAU), representing an exclusive club of prestigious research and graduate-intensive public and private universities; the National Association of Independent Colleges and Universities (NAICU), including private liberal arts institutions; and the American Association of Community and Junior Colleges (AACJC).

ACE, the six institutional associations, plus some dozen other higher education groups and programs, are members of the National Council on Higher Education (NCHE) and are located in one building at One Dupont Circle in Washington, D.C. As a result of their physical as well as issue proximity, those speaking for higher education in Washington are frequently referred to by their address at One Dupont Circle or simply as "the Community."

The association representing the largest number of postsecondary institutions in the country, however, is noticeably absent from One Dupont Circle. A stepchild within the traditional higher education community, the Career Colleges Association (CCA), formed by the merger of the National Association of Trade and Technical Schools and the Association of Independent Colleges and Schools in 1991, represents more than 2,000 nondegree proprietary postsecondary institutions enrolling more than one million students (Lee and Merisotis, 1990).

Concerning HEA, CCA supported simplification, Pell entitlement, loans for short-term training programs, tighter aid program oversight, and negotiated rule-making, but questioned institutional capability to administer direct loans. Implicated in the growing public concern about loan defaults, however, CCA focused its energies during reauthorization on issues surrounding program integrity and sought to clarify the oversight responsibilities of accrediting agencies, state licensing boards, and ED. Ford rejected ACE's solution of eliminating nondegree institutions from Title IV eligibility as "class warfare," and although not always supportive of CCA, did work to protect the interests of nondegree educational programs as reauthorization proceeded.

Also outside the One Dupont circle, the National Council of Higher Education Loan Programs (NCHELP) was an equally active and effective HEA '92 participant. Led by the widely respected former Senate and DOE staffer Jean Frohlicher, NCHELP represents student financial aid "providers" (e.g., lenders, servicers, secondary markets, bond counsels), and tries to hammer out conflicts internally in order to speak to the Hill and the White House with one voice. NCHELP early supported and expanded Ford's plan to "front load" Pell grants — raising the size of the grant for the first half of the curriculum and moving to loans for the second half — not only as a way to improve access for needy students but also to reduce loan defaults from in-and-out enrollments. When these plans were lost due to budget constraints in the fall of 1991, NCHELP put its considerable clout in support of program integrity and against direct lending where it was more successful. Direct lending proponents dismissed NCHELP's opposition as self-interest, but its staff provided honest criticism of the GAO's claims for savings, of Congressional micro management of ED, which was passed on as overregulation of the industry, and of total reliance on loans with no regard for the consequences to high-risk students. NCHELP's impact on HEA '92 was far-reaching; many of its technical ideas became part of the final bill, and its leadership was proud to claim that President Bush's veto threats were "issued in our behalf."

The Consequences of Preparation

The strategies participants adopted for preparing HEA recommendations illustrate the internal dynamics, and policy consequences, of the Washington higher education issue network. Soon after he reassumed the chairmanship of the House Subcommittee on Postsecondary Education in late January 1991, Ford send a letter to more than 160 associations and organizations interested in higher education, formally requesting recommendations for reauthorization. Proposals were to be presented in three columns — old language, proposed language, and rationale — drafted in formal legislative language and due on 15 April 1991. Ford and Wolanin saw this latter requirement as a way both to focus respondents to offer specific and, hopefully, realistic proposals and to share the tedious task of writing draft language. (An interesting side effect of the legislative language requirement was a contract boom for recently retired legislative drafter Blair Crownover and an advantage for participants such as NCHELP Director Jean Frohlicher and Wolanin himself who could draft legislative language on their own.)

As early as the fall of 1988, ACE organized a brainstorming retreat of key higher education policy makers from Congressional staff, OMB, ED, and the Brethren. In May 1989, Charles Saunders, senior vice president for governmental relations at ACE, convened six broadly representative task forces with the goal of developing a single set of recommendations for the higher education community. ACE took on the responsibility of coordinating a single set of reauthorization proposals at the direct request of Representative Ford. Several participants distinctly recalled the meeting in which Ford asked for one higher education position with the understanding that the stronger the consensus, the more seriously the recommendations would be considered.

The six 1989 task forces, augmented by two others in 1990, included members broadly representative of the higher education community. To some observers, however, the broad participation ended when their recommendations were submitted to a core committee of the Brethren chaired by Saunders. This group hammered out a set of recommendations that were presented to Ford by his April 1991 deadline. These consensus recommendations included a larger maximum Pell grant, indexed to the CPI; changes in Pell eligibility to include more middle-class families and to cover more of the cost of education (which helped higher cost private institutions); a pilot direct loan program; more flexible loan repayment plans; looser oversight regulations for institutions without default problems; tighter federal standards for accrediting agencies; studies of the effectiveness of state oversight agencies; and increased outreach efforts to attract more minority students to postsecondary education (ACE, 1991).

ACE's gatekeeping role had been intentional. When a consensus could not be reached or a recommendation was not seen as politically viable, the Brethren modified Task Force language or were silent. In the case of the Pell award formula recommendation, for example, the consensus was conditional. And the initial ACE document omitted proposals concerning the needs analysis formula entirely, following a tradition of deferring to NASFAA, which had not yet completed its internal recommendation process.

These arrangements had great consequence, resulting in success where the consensus was persuasive and real and failure when it was not. The consensus strategy also slowed the community's ability to respond to changes as the process developed. For example, the conditional agreement to an award formula (only if the maximum Pell grant was $3,700) had to be renegotiated within the community late in the process once it was clear that budget constraints would prevent the maximum from reaching this agreed-upon floor. Hill staff were not persuaded, and the ACE position was lost in conference trade-offs. On the other hand, the strong united front of the higher education community behind its recommendations for Titles VI, International Education, and IX, Graduate Programs, meant they were accepted almost verbatim.

Another important consequence came from ACE's initial deference to NASFAA to develop recommendations concerning the needs analysis formula. The ACE package, minus needs analysis, went to Ford as promised in April 1991. NASFAA did not present its final "Plan for Reform" for another month, partially preempted by Senator Ted Kennedy (D-MA), chair of the Senate Labor and Human Resources Committee, who introduced a thinly veiled version as S. 1137 in late April. Hurried, NASFAA had not analyzed the differential effect of its Plan on public versus private higher education sectors or adequately understood the Hill's priority for simplification. The result was a total rejection of the NASFAA proposal by ACE and its rapid internal mobilization to develop a new needs analysis recommendation of its own. NASFAA was further disadvantaged when its president was forced to resign as a charter member of the congressionally appointed Advisory Committee on Student Financial Aid because of a conflict of interest on delivery issues. The resulting shift in relationships greatly weakened NASFAA's voice and moved ACE into a new technical role with Hill staff.

The failure of NASFAA's "Plan for Reform" illustrates the impact of preparation strategies. NASFAA's Plan was developed from the ground up, starting with state, regional, and then national conferences to collect recommendations from individual aid officers. NASFAA membership represents every higher education sector, and given its distribution, unavoidably overrepresents private institutions and smaller colleges. Aid officers had long criticized the current needs formula for making it too easy for students to declare independent status in order to obtain aid. They also were concerned about collecting as much information about students as possible in order to direct limited institutional as well as federal funds to the most needy students. The result was a "Plan for Reform" that was exceedingly complex and advantaged dependent students, effectively redistributing funding from less expensive public institutions with a higher proportion of independent students to more expensive private sector institutions with a greater percentage of students with dependent status. Thus ACE and Hill objections.

The task force preparation strategy developed by NCHELP provides an instructive contrast to the ACE and NASFAA experiences. Like NASFAA, NCHELP had the advantage of preparing for HEA '92 as one organization rather than an ACE-type coalition. But unlike NASFAA, NCHELP used a top down rather than bottom up task force approach and got much more politically realistic results. A NCHELP legislative subcommittee also began work in 1989 to identify issues, but then handpicked members, and went through an "infinite" number of drafts and regional hearings before a final response, drafted into legislative language by Frohlicher, was adopted by the Board and sent to Ford in April 1991 right on schedule. A strong board kept members in line, strengthening NCHELP's "one voice" throughout reauthorization.

NASFAA and ACE's mistakes brought new players into the field. The still new federal Advisory Committee on Student Financial Assistance (ACSFA) stepped into the vacuum created by the opposition to NASFAA's proposal and ACE's hurried substitute. ACSFA was created in the 1986 reauthorization to compensate for ED's perceived inability to supply Congress with reliable analysis of the impact of student aid programs. Slow to organize, ACSFA hired Brian Fitzgerald, a relative outsider, as its executive director in March of 1988 and issued its first recommendations on improving the delivery system of federal aid applications a month later. In April 1989 ACSFA got one of the first letters asking for HEA recommendations from Representatives William (D-MT) and Bill Coleman (R-MO), then chair and minority leader of the House Postsecondary Education Subcommittee. Hill staff, particularly on the Senate side, appreciated ACSFA's responsiveness. As the reauthorization process unfolded, Senate committee staff increasingly turned to ACSFA for technical support and advice on a number of complex delivery, needs analysis, and award formula issues. In testimony to this enhanced role, Fitzgerald won a seat directly behind Senate staff during the final HEA Conference sessions.

HEA '92 and the Evolution of Federal Higher Education Policy

Signed by President Bush on 23 July 1992, Public Law 102-325 reauthorized the Higher Education Act for five years. The titles concerning student aid authorized some $20 billion per year for student grant, loan, and scholarship programs and made all students eligible for federal loans regardless of income. HEA '92 established a (scaled down) pilot direct loan program, made less-than-half-time students eligible for aid, instituted a single federal aid application form, and eliminated the value of a family home or farm from student aid need analyses. It also authorized funding for increased state oversight of higher education institutions, tightened reporting restrictions on participating institutions, and opened provisions concerning loan regulations to negotiated rule-making.

Despite Representative Ford's early call for "a thorough reexamination," the consensus necessary to support significant reform was not in place in 1992. HEA '65 and HEA '72's legacy of access through grants to needy students was compromised by the fiscal constraints of the 1980s with its consequences of flat allocations and rising tuition. The pressures for middle class relief, joined with public support for the ideas of personal responsibility and institutional accountability, received a full hearing in a presidential election year. Power shifts within the three major clusters of actors made unified action impossible. Legislative leadership (including staff) was powerful but could not impose its preferences; Administration officials were divided and ED was under attack; and the higher education community was fragmented by self-interest and turf.

HEA '92 is a valuable case study in the political realities of the federal policy process. Political power — the ability to affect the outcome — is a function of "skills and intentions" of major actors, limited by the "crosscurrents and constraints" of the environment in which they operate. A fragmented decision-making structure has led to the development of specialized policy centers of legislators, bureaucrats, and interest groups. History, public ideas, and the economic and social environment help shape issues and limit the options these actors can select.

The most active participants in the higher education policy process are those with the most at stake: the leadership of the relevant congressional committees, bureaucrats charged with implementation, and affected client or vendor interest groups. Presidential interest has been more sporadic and tied to larger policy agendas such as the war on poverty (Johnson), middle class values (Carter), antiregulation (Reagan), the federal deficit (Bush), or reinventing government (Clinton). Redistributive policies such as grants require a strong presidentially led coalition; without it, policy gradually becomes more distributive as it seeks a broader constituency.

In the words of several participants, HEA '92 was "a disappointment" which had the effect of "backing into a policy change" that converted higher education from a "social good to a consumer product" and paved the way for much greater federal regulation of academic "quality." The reorientation of federal student aid policy, however, was the inevitable result of the political configuration in Washington during the 102nd Congress, 1991–1992. A new president with a new agenda, new set of congressional leaders, a realignment within the higher education community, a more stable economic environment, and a new set of public ideas about the role of the federal government in higher education will bring with them new policy choices. Those interested in the role of the federal government in higher education must take this new set of political actors and new political environment into consideration and develop strategies that use its leverage points to their advantage.

Interviews

More than fifty interviews with participants in the 1992 HEA Reauthorization process, including key House and Senate committee and subcommittee staff; Department of Education, OMB, and White House Policy staff; and representatives of higher education associations and services organizations.

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Action Research into the Quality of Student Learning

A Paradigm for Faculty Development

Quality Assurance for Teaching

Higher education has been the subject of increasing criticism in recent years. Daly [12], for example, reviewed no less than thirty-seven major reports and articles from government agencies, employers, and academics, detailing faults with higher education in the United States. Critics have been just as vocal in the rest of the world. Partly in response to this chorus of concern, governments have moved to make universities and colleges more accountable for the finances they receive from state coffers. Concern about the quality of teaching has been particularly strong as many have begun to suspect that teaching has been relegated to a poor second place behind research because of ever increasing pressure on academics to publish. The general thrust has usually been toward mechanisms for quality assurance of teaching. Either external systems are imposed or universities are encouraged or required to establish their own procedures. Inspection teams may be used to ensure that internally established mechanisms are adequate.

In discussing quality assurance and quality enhancement in this article, we draw upon a distinction made by Elton [14]. He grouped the quality "A's": quality assurance, accountability, audit, and assessment, and saw them as concerned with control of both quality and the people who control quality. Quality enhancement was seen as related to the "E's": empowerment, enthusiasm, expertise, and excellence.

Program accreditation is a mechanism for quality assurance that has become almost universal. Internal or external panels may withhold approval for a program to be offered if they are not convinced the program can be taught according to an adequate standard. Use of external examiners is another well-established quality assurance mechanism de-

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signed to verify the appropriateness of degree awards. Recently it has also become more common to appraise teaching directly. The most widely used mechanism has been the use of student feedback questionnaires, though some institutions have sought more diverse forms of feedback through teaching profiles or portfolios [15, 33].

The limitation of these and other forms of quality assurance is that they concentrate on bringing the poorest teachers and courses up to some level of minimum acceptance. Program accreditation panels can withhold approval if a proposed program has not been adequately planned, but there is no mechanism for giving real rewards to teams preparing outstanding programs. Similarly, external examiners can refuse to approve results if quality appears unsatisfactory but can offer little beyond a pat on the back for good or even excellent teaching.

Appraisal of individual teachers also tends to make use of sticks for the poorest performers rather than carrots for the best. Those who receive poor ratings from questionnaires or other evaluation face the threat of not having contracts renewed, tenure not granted, or other sanctions. In theory outstanding teachers could be rewarded with promotions, but institutions that actually do this still seem to be considered as sufficiently rare and innovatory that their procedures are deemed worthy of publications in the literature [e.g., 1]. Even where universities have introduced teaching as an explicit criteria for promotion, the popular perception is that promotions still go to those with the best research records [10, 28]. If teaching is taken into account at all, it is largely in terms of reaching some threshold level of performance.

Even ideal quality assurance mechanisms, then, do little or nothing to encourage teachers or courses to go beyond minimum acceptable levels. In fact, excessively onerous or iniquitous assurance mechanisms can have a negative effect on the quality of teaching by those above the threshold. Firstly, the assurance procedures require faculty to produce evidence that their teaching is of an acceptable standard and courses have been adequately planned. Producing the necessary documentation requires time (often considerable time) that could otherwise have been spent on enhancing teaching or program quality. Quality assurance mechanisms have the unfortunate side effect of diverting faculty time from the very activities — teaching and research — they are meant to legitimate. Secondly, excessively intrusive or iniquitous teaching approval systems can lead to anxiety, conservatism, and worse teaching rather than encourage better and more innovative teaching [30].

Quality Enhancement of Teaching

Whereas quality assurance seeks to ensure minimum acceptable levels, quality enhancement aims for an overall increase in the quality of teaching. In practice it often encourages the better teachers toward higher quality and more innovative practices. There is also an expectation that the majority of faculty will be influenced by the commitment, exhortations, and curriculum development initiatives of the active enthusiasts.

Quality assurance mechanisms are imposed from above, either by university administrations or by external bodies. Quality enhancement measures, though, cannot be imposed by regulation. Encouragement of quality enhancement initiatives tends to be the concern of faculty development units or similar bodies. Administrations can at best form such units, provide resources, and offer institutional endorsement.

As governments have recently become more concerned about teaching quality and, more importantly, have tried to relate funding to teaching quality, there have been increases in the number and size of faculty development units. Many universities now have units with titles such as Faculty Development Unit, Center for Teaching Excellence, Educational Development Unit, Center for Teaching and Learning, and Academic Staff Development Unit.

What is noticeable, though, is that there is a marked lack of literature on the mechanisms by which these faculty development units can enhance the quality of teaching in universities. The wide diversity in titles can be interpreted as evidence of the absence of clearly articulated paradigms for the functioning of the units. Given the growing number of both faculty development units and faculty developers, we believe that it is timely for a greater consideration of the theories or paradigms which underpin the activities of faculty developers. The act of forming a unit certainly does not automatically lead to quality enhancement.

It is not surprising that modes of faculty development have a limited theory base. At the pragmatic level many faculty development units are poorly staffed and their very existence is tenuous. There is pressure to make an impact and to be seen to be doing "something." Short-term local pragmatics can have precedence over establishing more theoretically sound programs. However, eventually the adoption of short-term pragmatic measures is likely to rebound on the perpetrators if they fail to achieve any real change. The central mission of most faculty development units is improving the quality (however defined) of teaching and learning within their institution. Such a demanding mission clearly requires a long-term perspective; however, the pragmatic position results in short-term exercises. If faculty developers concentrate on an immediate impact, they may fail to address their central mission by ignoring the change agent facet of their role. Programs operated by faculty development units need to be sound with respect to both educational theories and theories of change and organizational development if they are to bring about improvement in the quality of teaching and learning.

In this article we propose to address this issue by providing a rationale for one paradigm of faculty development, focusing on quality enhancement of teaching. The aim is not to show that it is the best or the only viable mode of faculty development. Rather, it is to demonstrate that sound faculty development initiatives develop from appropriate bases in both the educational and the organizational change literature and that formulated programs need to be refined by practice. We suspect that similar cases could be made for other approaches to faculty development and that these may turn out to be complementary rather than competing. We do not believe that there is only one appropriate way to tackle complex faculty development issues.

Pretexts for Faculty Development

Our starting point for developing a rationale for a faculty development program is one of the few articles we have discovered that does address the issue of theories or paradigms underpinning faculty development activities. The article is by Graham Webb [36] and has the title "On pretexts for higher education development activities." Webb gives three "pretexts" for faculty development activities based upon positivist, interpretive, and critical epistemologies. Webb asserts that positivism has been the dominant paradigm for faculty development activities. A scenario typical of this pretext might be a personal counseling session, workshop or short course delivering advice on good teaching practice. The advice would typically be based upon research that followed a positivist educational psychology paradigm.

Like Webb, we find difficulties with this approach. First, it assumes a simplistic delivery system view of education. It assumes that there are universally applicable recipes for good teaching. However, because students are so varied, institutions idiosyncratic, and teachers heterogeneous, universal remedies have not proved to be a cure-all solution. There are numerous publications giving suggestions or hints for good teaching, yet still there are voluminous criticisms of higher education. The rise in the number of faculty development units is a tacit admission that simplistic recipes have not worked.

Even when faculty do receive soundly based advice in workshops or courses, they often find it very difficult to implement their new found wisdom in the swampy ground of the classroom. They invariably have greater difficulty still when changes impinge upon their departmental colleagues, as they normally do. In essence the positivistic paradigm for staff development fails to address the vital issue of implementation.

A Synthesis of the Interpretive and Critical Positions

Webb is then left with pretexts based upon interpretive understandings and critical theory. He suggests that both paradigms have advantages over the positivist position but that both in turn have their own problems. Our own position is to draw from the two paradigms those elements that appear to be most satisfactory and least problematic and to synthesize from them an approach to faculty development. This approach was not developed purely from theory, indeed, it would be truer to describe the theoretical formulation as a post hoc justification. The practice of faculty development has evolved to suit a perceived environment within our institution and has been adapted and refined in the light of lessons learned during its operation.

The mode of faculty development we are advocating is action research projects that seek to examine and improve aspects of the participants' teaching, with the aim of improving the quality of their students' learning. We intend to examine this form of faculty development against the two pretexts of critical theory and interpretive understandings. In doing so we will try to justify, on both theoretical and practical grounds, why particular positions are taken. In the process we hope to draw out the advantages of action research projects as a method of faculty development. A case study is described to show the application of the advocated position.

Action Research

Action research is the mode of research associated with critical theory. There are, though, several schools or variants of action research, which vary in the degree to which they are influenced by critical theory. There are characteristics common to action research which collectively distinguish it from research conducted under positivist or interpretive paradigms. The characteristics of action research listed below have been distilled from a number of accounts representing the major typologies [8, 13, 25, 26, 34]. In the following text in this section each of these aspects of action research will be briefly discussed.

Action research

- is concerned with social practice
- is participative

- allows participants to decide topics
- aims toward improvement
- is a cyclical process
- involves systematic inquiry
- is a reflective process.

Action research has been widely applied in the fields of education, management, social work, and so on. In education it has been reasonably prevalent in the school sector but less widespread in higher education. It is applicable in situations in which participants wish to improve their own practice. The mode has been called "participative action research," indicating, first, that it is normally a group activity involving those affected by the topic being investigated. There may well be an attempt to widen the circle of involvement to include others involved in the practice. Many would consider it essential that action research be conducted by a group. Others, however, accept that it can be an individual problem-solving activity or an individual reflecting on his or her practice. The term "participative" is also indicative of the importance placed on the participation of practitioners themselves. A distinction has been made with other paradigms where it is more common for expert researchers to conduct inquiries and hand down their findings and recommendations to those in the field.

The roles of the practitioner and expert researcher also influence the subject matter of action research. It has been claimed [8, 34] that educational researchers following other paradigms commonly concentrate upon theoretical issues which are of little interest or relevance to teachers. In action research, though, it is the participants or teachers who decide the subject or topic for research. It can be something they think is interesting or important, or it can be a problem they want to solve.

Perhaps the clearest distinction between action research and other modes lies in the attitude to changes to what is being researched. Other paradigms tend to avoid perturbing the subject of their research. Action researchers set out with the avowed intention of improving their practice. Lewin [22] and Rapoport [31] both maintain that research should go beyond the production of books and articles to achieving social change.

Action research is portrayed as a cyclical or spiral process involving steps of planning, acting, observing and reflecting. It is normal for a project to go through two or more cycles in an iterative process. Improvement is brought about by a series of cycles, each incorporating lessons from previous cycles.

It should not be thought that action research is a soft or imprecise mode, because rigorous systematic inquiry is as integral to it as it is for other paradigms. The action research cycle incorporates systematic observation and evaluation. Outcomes of systematic inquiry are made public and subjected to normal criteria for scrutiny and acceptance. Action research does, then, contribute to both social practice and the development of theory. Its advocates claim that it brings theory closer to practice.

The Importance of Perspective Transformation

Critical reflection upon practice is an important element of action research for faculty development, because it is through critical reflection that changes of attitude can occur. Critical theory provides a vehicle by which participants can undergo a process which Mezirow [27] refers to as "perspective transformation." Essentially they need to reach a state of self-realization that enables them to envisage the influence of past assumptions and constraints so as to permit a movement toward actions more consistent with new understandings.

Practices in higher education are often strongly influenced by conventions to which faculty become so accustomed that they can become unconscious that they are conventions. Whereas some of these unconscious conventions can be beneficial, others may have a negative influence on the quality of teaching and learning. For change to occur it is necessary that involved faculty realize that their actions are being influenced by unconscious conventions, that they make those conventions explicit, and that they evaluate their merit.

A particularly important deep-seated belief is the faculty's understanding of teaching. Several researchers have observed discrete qualitative categories for conceptions of teaching [17, 20, 23, 29, 32]. Martin and Ramsden [23] believe that staff development programs need to embrace the issue of changing the way academic staff conceptualize the teaching of their subjects.

A compelling argument in favor of this assertion comes from evidence of the strong relationship between orientations to teaching and the quality of student learning [17, 19]. Two main orientations to teaching were identified: knowledge transmission and learning facilitation. Departments with high mean scores for the knowledge transmission orientation tended to depress the use of a deep approach to learning. Departments more attuned to learning facilitation were less likely to promote a surface approach to learning. By the normal standards of educational research many of the observed correlations were quite appreciable.

Action research projects do provide a mechanism for perspective transformation through regular meetings of participants. In these sessions participants reflect upon their experiences with respect to the project topic, which is an aspect of the participants teaching that they select as being of particular interest or concern. Through discourse within the meetings the perspective of both individuals and the group as a whole can be transformed. Because true action research projects need at least two cycles of planning, action, observation, and reflection, there is time for perspective transformation to take place. It is clear [9, 35] that conceptual change is a difficult and lengthy process, therefore, if change is to occur, it is necessary to engage participants for at least two cycles, which would normally last for a semester or academic year each. Similarly, Martin and Ramsden [23] recommend that a course for academic staff should extend over a period of at least one year if faculty are to change their understanding of teaching.

Use of Interpretive Evidence

The action research projects in our institution have not been confined to seeking enlightenment through critique. During the observation phase of the projects, observations have been made and data gathered to increase understanding of the effects of the educational innovation and examine influences on learning outcomes from the students' perspective.

The methods of observing and evaluating the effects of the educational innovations, and the uses to which the data are put, fit within the interpretive understanding pretext. Because the projects have had varied topics or focuses, the methods of evaluation and observation have necessarily been diverse. Many have included examinations of students' approaches to learning and their relationship to contextual variables such as assessment, workload, the learning environment, the program demands, and the curriculum design.

Projects have employed both quantitative and qualitative methods. Semistructured interviews with students have proved to be a valuable tool for discovering what students think are the important issues. Questionnaires with both closed- and open-ended questions have also been widely used to gather student feedback. The Study Process Questionnaire (SPQ) [5] has also been used in a longitudinal or repeated measures design to examine the influence of teaching and the learning environment on approaches to learning.

Evidence gathered during the interpretive observation process can be used to convince initially skeptical colleagues within a department that change is necessary. There is, then, a mechanism for persuading and involving those not originally committed to the project. That there is this mechanism for widening the circle of involvement is important. Departments rarely rise as one with fervent conviction for an educational innovation. Instead, attitudes tend to lie on a spectrum from enthusiasm and commitment through guarded noncommitment, to marked suspicion, or outright hostility. Projects, therefore, tend to start with a small group of committed activists making innovations within individual courses they teach. But for change to be effective, it is usually necessary to influence the program team as a whole. Skeptical colleagues, therefore, need to be convinced that change is necessary. This is far more likely to happen through presentation of evidence from evaluation of the change than through the critique of a discourse in which all did not participate.

Interpretive evidence can also be communicated to a wider audience in the form of published articles. There is then a contribution to educational theory as well as to educational change within courses taught by the participants. Lewin [22] and Rapoport [31] feel that it is both appropriate and legitimate for action researchers to contribute to social theory and social change.

Because publications can result from participation in educational action research projects, there is an incentive for faculty to participate and actively to commit themselves to the projects. Universities see publications as the prime indicator of academic achievement, so it is important for staff to publish if they wish to be promoted, become tenured, or even retain their positions. Action research projects are unusual for faculty development activities in that participants can receive tangible rewards. All too often those who are committed to their teaching go unrewarded, or are even penalized, as the time spent on faculty development activities is time unavailable for research, which traditionally does reap rewards.

In some newer universities, which have staff with limited research experience, educational action research projects can act as an initial step on the research ladder. The topic for research is their own teaching, which may be the participants' primary interest. Participation within a group, containing some more experienced researchers can help with the acquisition of research skills.

The Role of the Faculty Developer

The perceptive reader may well have noticed that the characterized project approach can take place without any involvement of a faculty developer. Groups of committed teachers do gather together to change their teaching practices. Recent attempts to promote educational action research projects [16, 19, 21, 38], though, suggest that there are more latent participants who can be catalyzed into action than there are self-starters.

The faculty developer seeking to get projects started has to deal with one of the paradoxes of action research. For action research projects the focus or topic of concern should be determined by the participants. Yet groups of teachers rarely rise as one, determined to tackle the same issue. Even if they do, they may be unsure as to how to proceed. Stenhouse [34] suggested a solution to this paradox by advising action researchers (or faculty developers) to act as "critical friends." The faculty developer can encourage and prompt academics to start projects, leaving the choice of subject to the faculty. Once projects start, the faculty developer becomes a supportive collaborator. Any advice as to the conduct of the project or inputs from the educational literature can be advanced following Stenhouse's recommendations [34, p. 142] as provisional specifications to be tested rather than unqualified recommendations. The relationship between faculty developer and lecturers, therefore, moves away from an advisor/client one toward a more even relationship with each respecting the expertise of the other.

A Case Study: Promoting Educational Change Within a Department

This is an overview of an action research study that started initially as one academic's attempt to bring about change within a course that was her own area of responsibility. The study exhibits the influence of critical theory in bringing about changes in attitude among the teaching staff and interpretive analysis in showing the effectiveness of the changes implemented. The roles of the two authors in the study are that of "critical friend" and "committed activist." David as a faculty developer has been the critical friend and supportive collaborator throughout the study. Jan was the committed activist: the member of the department who was interested in teaching and prepared to try to bring about improvement in programs taught by the department.

Background to the Study

Jan coordinated the clinical practice element in the Professional Diploma in Diagnostic Radiography (PDDR). The Professional Diploma, an academic award peculiar to this institution, was described in institutional documents as offering the specific and vocational aims of a degree but not the general education characteristics [11]. It has since been phased out. Most of the courses that offered this qualification have been upgraded to baccalaureate degree status. Those programs which could not meet the stated degree criteria would be relegated to Higher Diploma. The Higher Diploma is described in institutional documents as providing a level of education and training appropriate to technicians in the appropriate profession [11].

The PDDR followed the traditional format for radiography training in the Western world. Students progressed on the program by passing a series of written examinations and gained clinical experience along the way. The taught part of the program was conducted mostly through lectures, with laboratory and tutorial groups forming approximately one third of the overall staff/student contact time. Continuous and final assessment processes were heavily dominated by written examinations. In general, small group teaching activities were not used to provide evidence of student progress. Students' effectiveness in the application of learning in clinical practice was assessed simply as pass/fail. The criteria set down for successful completion of the clinical component required students to fulfill a quota of hours in clinical placements during the course, and to record a specified number of cases in a Record of Clinical Training to be viewed by Viva Voce examiners during the final examinations. The description of clinical training in course documents did not include criteria for either a pass or fail grade.

The starting point for an action research initiative was Jan's concern that the program made little attempt to integrate theoretical learning with its clinical application. Concerns about the credibility of the program to develop radiographers suitable for modern day clinical practice led to the development of an initiative that aimed to determine whether the introduction of problem-solving exercises could assist students to integrate learning from separate subject areas and use the elaborated learning in a clinical context.

The particular problem with the clinical practice component of the Professional Diploma program highlighted an underlying issue in the training of radiographers to encourage the use of theoretical learning in an analytical, problem-solving manner suitable to the clinical context. Graduates need to enter clinical practice with the confidence and ability to make judgments on present practices and know how to keep abreast of advances. They should be trained to develop the necessary skills to manage their own learning and the ability to adapt what they learn to the clinical context. The outcome of such development would be flexibility and continued growth as a result of active involvement in the profession.

Methodology for Self-Reported Action Research

At this point it is necessary to say something about the methodology for analyzing and writing about self-reported action research. Unless stringent procedures are followed there must be a suspicion that the self-reporters have presented an account that favors their own position [7, 37]. The main safeguard is that of triangulation of data from a wide variety of sources. Triangulation is the means by which data from one source is compared and contrasted with evidence from another to strengthen the evidence gained and enhance the validity of the findings. For this study evidence of the change processes came from semistructured interviews with a wide range of groups, which included students, program team members, two panel members involved with accreditation procedures, and management-level staff of the department. Reports from accreditation meetings, minutes of faculty meetings, subject and course reports, and other official reports were important data sources (see Table 1).

Those interviewed were each asked to review the transcript of their interview to ensure agreement and to correct any misinterpretation from the recording and transcription process. Descriptive reporting on the development processes within the academic department was examined by four members of the department who verified it as an accurate reflection of what had transpired. Evidence of the effectiveness of the changes on student learning outcomes came from interpretive evidence

TABLE 1

Cycles of Action and Sources of Data

Cycles	Action	Data
1–3	Encouraging the use of problem-solving activities within clinical education	Data compared pre- and postintervention: Formal examination results Study Process Questionnaire (SPQ) Postintervention: SOLO Taxonomy
4	Development of second degree program	Comparisons were made between the current degree program and both the PDDR and failed degree proposal, using: Course scheme documents Course Committee Meeting minutes Course accreditation reports Semistructured interviews
5	Students on first intake to the program were monitored for progress	Evidence was gathered from: Subject reports Annual Course Reports Course Committee Meeting minutes Student Process Questionnaire (SPQ) Semistructured interviews
6	In-house staff development initiatives	Evidence was gathered from: Workshop reports Subject reports Program developments External (contextual) developments Semistructured interviews

including the Study Process Questionnaire (SPQ) [5], SOLO taxonomy [6], and semistructured interviews.

The First Three Cycles of Action

Initially the study was designed to encompass three cycles of action with the aim of encouraging integrated, problem-solving abilities in students of the PDDR in their clinical placements. The cycles of action were implemented, with changes being made as a result of reflection upon the previous cycle. A control group was used, though this is not usual in action research, which provided significant information in the review of the results. The experimental and control groups occurred naturally within the structure of the program. Members of both groups completed their clinical training requirements according to the criteria given in the course scheme.

The action involved the second year PDDR students assigned to the experimental group in making evaluations of the clinical placements they attended over three successive periods of clinical training. The aim of this action was to encourage them to reflect upon the significance of theoretical learning in the clinical application and to integrate learning from separate subject areas of their course. After attending a period of clinical practice, the students were brought together in groups to discuss their experiences. Students were also provided with an annotated reading list incorporating articles related to their stage of training from five professional journals, which they were encouraged to use as references over the time of the intervention. Changes between cycles occurred mainly to arrangements of the discussion groups. The number of students who attended each group was limited to a maximum of eight for the second and third cycles, compared to up to fourteen in the first cycle. The number of discussion groups each student attended after a placement period was limited to two for the second and third cycles, whereas they had each attended four in the first cycle. Prereading of the students' evaluations from the clinical placements, which did not occur for the first cycle, provided more focus to discussions in the second and third cycles and prompted problem-solving situations to be introduced into the third cycle discussions.

Several pre- and post-test measures were used to determine any change:

1. The SPQ was administered pre- and postintervention.
2. Pre- and postintervention academic results were compared between the experiment and control groups.
3. Three open-ended questions were given at the end of the intervention and the answers graded according to the SOLO taxonomy.

No change was noted from items 1 and 2, but a statistically significant difference was noted between the two groups from the results of item 3 [24].

The SOLO taxonomy is a qualitative measure that depends upon information-processing abilities and reflects the quality of learning in responses given to open-ended questions. For this study students from the experimental and control groups were given three open-ended questions, which related directly to the clinical situations they had encountered over the past year. Answers required the adaptation of theoretical learning to specific situations. An example of the questions is:

> Think back to the experience of ONE of your general clinical placements and discuss how you feel the equipment you used aided or limited the quality of the examinations taken. In your discussion take patient care, radiation protection/dosage and film quality into account.

The results may suggest that any major change can only be effected with a change to the structure and development of the course. It is evident that change within one aspect of the program will not support generalized change throughout [16]; it does show, however, that it is possible to encourage students to use a problem-solving approach to their learning.

Change Widening to Encompass the Program Team

The widening of the study to encompass the entire program occurred when a proposal to upgrade to baccalaureate degree level (as a result of the phasing out of the PDDR) was rejected by an internal panel during the initial stage of an accreditation process. Reasons for the failure were made clear in the panel's subsequent report.

> The panel expresses disappointment that in both the documentation and the subsequent discussion, the program planning committee has neither evidenced the level of maturity and preparedness appropriate to offering the program at degree level nor demonstrated as a program team that they have coherently worked through the key issues including the development of an adequate theoretical basis, achievement of integration, both vertically and horizontally and in the balance between theoretical and clinical work. . . . The proposed degree program is too practice-oriented and there is insufficient theoretical basis evident in the program curriculum to ensure that the apprehension of theory and its application in practice in a professional context will be of a form and level appropriate to a degree program [2, p. 1].

Complete rejection of a program proposal is an unusual event within the institution. Teams will frequently need to make adjustments and revisions on the advice of the panel before presenting it to the next, external phase of accreditation, but a search by the Polytechnic's

Academic Secretariat revealed only seven courses that have been required to restart the process (Ting, personal communication, October 1994). The 1992 Institutional Review [18] shows that since 1982 there have been sixty-three baccalaureate degree or master's programs successfully accredited, and the number of subdegree courses was probably even higher. The rejection and the reasons given by the panel clearly show that at that point in time the department was very weak with respect to teaching. The subsequent cycles of this case study are therefore very unusual, as published articles about teaching initiatives usually emanate from individuals or departments who are enthusiastic about teaching and would normally be considered good, or more often outstanding, teachers [16].

Some weeks after the failure of the degree proposal and after a period of hiatus within the program team, Jan was asked by a senior staff member if she would assume the role of program team leader for the redevelopment process. This point constituted the beginning of the wider cycle of the study and the broadening of it to include the whole program team, a feature significant of action research. From this point there were no experimental/control group comparisons. This phase in many respects involved an intertwining of two aspects toward a common outcome. They are the development of the second degree proposal and the development of appropriate strategies within the program team itself to be able to manage the changes. The overlapping of events within the department and the action research study are demonstrated in Table 2.

Initiating Reflection Within the Program Team

Time allowed for reflection, discussion, and reappraisal was a major step in the redevelopment process. Before any consideration was given to course content and curriculum development, one important aspect had to be agreed upon. What is required of a new graduate within the profession? This decision was not taken in isolation within the teaching team but with the understanding of the requirements of the profession, a process that led naturally into the development of overall aims and objectives and, importantly, the realization that it was necessary to develop graduates with the understanding and abilities to remain current within a progressive profession.

The period of reflection, discussion, and reappraisal also initiated the development of team cohesion, which was noted to be absent in the accreditation report. The teaching timetable was rearranged so that all members would be available for one afternoon a week to attend curriculum development meetings, encouraging regular, ongoing discussions. These meetings were informal and mainly involved members of

TABLE 2
Departmental Developments and Action Research Cycles

1989	1990	1991	1992	1993
Individual's initiative to introduce problem-solving activities into learning process.			Development of second degree proposal.	First year of degree programme.
First degree proposal developed, failed at accreditation. Cycles 1–3			Original programme still operating. Cycle 4	Original programme phasing out. Cycle 5
			Staff development iniatives commenced during curriculum development cycle continued into the implementation cycle. Staff development continues as part of annual programme. Cycle 6	

the faculty who developed a sense of "ownership" as the program evolved from the resulting discussions and debates. This result was in itself a major change compared with the previous experience, when the faculty had never met on a regular basis.

Development of the Second Degree Proposal

Information from the initial study into student learning was useful for the subsequent development of the degree proposal. It provided the encouragement needed to open up the teaching/learning patterns and the confidence to know that students were capable and able to meet the challenge of student-centered learning.

The pattern of individual course development was very different from the PDDR and initial degree proposal. The lecture content was reduced, and learning within laboratory and tutorial settings was widely developed. Material within course areas was rationalized so that students could expect to undertake background reading for specified topics where the learning was factual and well explained in texts. Effort was made to make the style of teaching/learning relevant to the required outcome. Assessment schemes reflected the aims and objectives of individual subjects and provided feedback to students as well as showing evidence of progress in learning. Table 3 compares the number of hours allocated to different teaching activities for the PDDR, first degree proposal, and accredited degree program.

Considerable effort was made to ensure that clinical studies were integrated into the program. For example, no period of clinical experience was undertaken without the theoretical component having been covered first; the aims and objectives of each stage of clinical practice were clearly stated; and assessment elements, introduced for the first time, related to the expected learning outcomes to demonstrate the students' progress and development. None of these measures was evident in either the PDDR or first degree proposal.

The implemented changes would not be significant without also ensuring that students had the time to reflect and consolidate the learning processes in which they were involved. The student to staff contact hours were considerably reduced, compared to the Professional Diploma and initial degree proposal, to ensure that students had the time to pursue an active learning process (see Table 4).

Processes of Change Within the Program Team

Because the teaching/learning and assessment formats proposed for this program were substantially different from those of the PDDR and initial degree proposal, it would not have been reasonable to introduce them without addressing the needs of the teaching staff involved. The program team, by and large, had not previously been involved in educational development, and concern was expressed about implementing appropriate student learning initiatives. Hesitancy was obvious over relinquishing control of teaching and losing the safety net of written final examinations. To address these concerns and assist in the appropriate implementation of the program initiatives, a series of workshops were conducted. These encompassed tutorial management, designing assessment to suit required learning outcomes, clinical supervision and assessment, and project development and supervision. Action research was introduced as a possible means of monitoring individual course development. Clinical instruction workshops have been a particularly im-

TABLE 3

A Comparison of Teaching Patterns

Course	Lecture	Laboratory	Tutorial	Project
Professional Diploma	987	336	75	0
First degree proposal	901	226	487	0
Second degree proposal	465	258	318	28

TABLE 4

Comparison of Contact Hours/Week

Year	PDDR	1st Degree Proposal	2nd Degree Proposal
One	24	21	23
Two	29	22	14
Three	26	19	6

portant development and, for the first time, have involved faculty and clinical colleagues in a joint process of development.

The staff development exercises were important in establishing a good understanding among team members of what we were hoping to achieve and further to encourage the idea of team effort considered important to the overall success. It cannot be stressed enough that although members of this program team, on average, had been part of the same group for a number of years, there had not been until this time any requirement to work together as an integrated unit.

The second degree proposal was successful at both the internal and external stages of accreditation. The internal accreditation report noted:

> The panel was impressed with the cohesiveness of the course planning committee as a team and commended the committee for the preparation of a submission which has greatly improved from the previous Diagnostic Imaging degree proposal [3, p. 1].

The external accreditation report stated:

> The proposed innovative approach to clinical training and academic studies represents a radical departure from the programs in Radiography elsewhere. However, the staff members have demonstrated themselves as a coherent and determined team. . . . Their efforts in blending the various interested parties together and in integrating their inputs in the planning stage of the B.Sc. course are to be congratulated [4, p. 12].

A series of semistructured interviews was conducted with the program team members after the accreditation and before the first intake of students. The interviews clearly demonstrate the lack of involvement felt by members at all stages leading to the first degree proposal. For example:

> First, there wasn't any team effort as such. Not everybody was involved and not everybody pulled together to produce a satisfactory end result (Lecturer 1).
>
> Mostly it failed because we didn't use the planning time to review the course widely. And then not functioning well as a team, we hadn't all been part of the planning process. We'd read all the documents several times, but that was not saying it was actually putting forward our opinions and discussing them. So we didn't feel ownership about it and that probably came out very powerfully (Lecturer 6).

In contrast to this is the strong approval expressed for the subsequent program, including a sense of "ownership" team members felt because of their participation at all stages of the development.

> There is a demand by our profession for better education, both at undergraduate and post-graduate level. So, the second time around it was more

> evident to people that we really have to pull together more and that everybody needed to make a contribution . . . during the entire development of the second program there was not only a more cohesive team effort within the section, but also much more communication outside the section. A lot more people outside were drawn in and we had a much wider contribution from the profession (Lecturer 1).
>
> I think everybody contributed their part in writing up the syllabus and all the background and the preparation of the papers. Team work is also being carried out. Unlike the first B.Sc. proposal, actually not everyone of us were involved (Lecturer 2).

There is evidence of a marked change and formation of a team when the comments from the accreditation panels for the two degree proposals are compared and the opinions are noted by team members in their interviews. The staff development initiatives have been the means by which team members have been able to gain the substance on which to develop the changes they have been required to make.

Perspective transformation is described as a state of self-realization that allows individuals to review the influence of past assumptions and constraints so as to permit a movement toward actions that are more consistent with new understandings [27]. In this study there is evidence that individuals of the program team have shown varying degrees of conceptual change. The team has collectively demonstrated evidence of improvement and a willingness to be responsible for curriculum change and the quality of teaching and learning.

Monitoring Student Progress

Students on the first intake have had their learning approaches monitored using the SPQ [5]. For the purposes of this study the most important scale of the SPQ was that for deep approach. High scores on this scale indicate a student with intrinsic interest who actively seeks understanding of the subject matter. By contrast, students employing a surface approach tend to display little interest in the course material and try to rote learn what they feel is likely to appear in the examinations. Learning approaches are influenced by the curriculum design and the teaching and learning environment. Repeated application of the SPQ shows how learning approaches have changed as the program proceeds and may be assumed to indicate the influence of the teaching and learning context upon learning approaches.

The SPQ mean deep approach scores for the two courses are shown in Figure 1. The figure shows data for the penultimate (RPD1) and final (RPD2) intakes to the Diploma course and for the first (RBSC1) and second (RBSC2) intakes to the degree course. The apparent declines in deep approach scores for the two Diploma intakes were not statistically

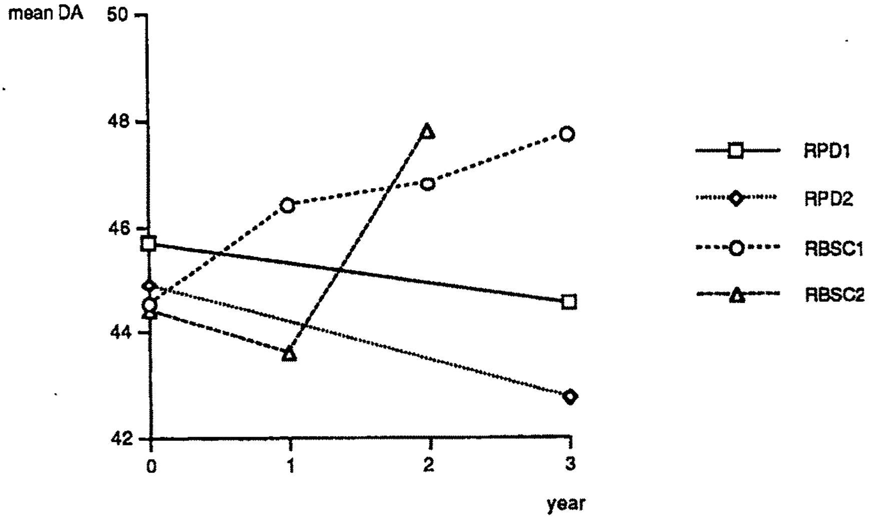

FIG. 1. Mean SPQ Scores for the Radiography Courses

significant ($F = 1.74$ for RPD1 and $F = 1.64$ for RPD2). These data, however, are quite sufficient to establish that a change has occurred between the two courses, as the multivariate test of the repeated measures analysis of variance showed that mean deep approach scores for the two intakes to the degree courses did have a statistically significant increase ($F = 5.3$, $DF = 41$, $p < 0.01$ for RBSC1 and $F = 7.7$, $DF = 38$, $p < 0.01$ for RBSC2).

The two intakes to the degree course were respectively 69 and 70. The DF figures in the test arise because of the listwise treatment of missing values. Any student who fails to provide a usable value for just one item of the applications of the SPQ is deleted from the sample. The usable sample is nevertheless, representative, because the mean SPQ scores for the sample remaining after listwise deletion are virtually identical to mean values for the three or four applications of the SPQ obtained when all students who completed the questionnaire on individual applications are retained.

It is assumed that the increase in the mean deep score for the degree students can be attributed to the change in teaching and assessment formats, which have, as much as possible, tried to present learning situations that are relevant to the required learning outcomes.

The results from the SPQ are borne out by a series of interviews that were conducted with a range of students from the first degree intake toward the end of the first year. The interviews were semistructured and undertaken by a research assistant not involved in the teaching program. They indicate acceptance for active student learning measures and a positive relationship between theoretical learning and clinical experience. A majority of those interviewed said their interest in the program had increased over the first year (58%), some felt their interest remained unchanged (26%), 11% found their interest had decreased, and 5% gave an ambiguous response. Of the interviewees, 71% felt they had been well prepared for their first block of clinical experience, whereas 29% were not entirely happy about some aspect. Several of the interviewed students suggested that their interest in the program had increased after their first period of clinical experience and that classroom learning was relevant to their clinical progress.

> I think the most important change that I have noticed is the method of learning. [Previously] the method of learning is spoon feeding, or the lecturer gives many notes and handouts for us to read-out and then have an examination or test. In this course, there is more thinking and active learning. For example, in doing my Image Management Report, we need to pay more effort to think which is the right way to do this experiment, and then make a conclusion from this experiment. Sometimes, we need to think differently from the books or reference texts. We need to pay more logical thinking on this . . . because it comes from the experiment and not from the textbook. We have to observe the experiment and write our own conclusion afterwards (Student 11).
>
> In this program there are many choices of subjects . . . and I find they are very useful. Besides that there are practical classes which are very interesting. There are clinical training and it is very helpful to us. . . . I think the program has many advantages such as clinical training. Because in clinical training we can see the real situation and observe what the Radiographer is doing, how he copes with the problem. . . . I think the subjects can help us learn more about the job of a Radiographer (Student 6).

The connections the students are making between their theoretical learning and clinical experience are particularly pleasing in light of the initial reasons for initiating the study.

Teaching and assessment strategies for the degree program are considerably different from the previous experience of most of the teaching team. The proposed changes engendered a degree of skepticism on the part of some faculty. Data gathered during the study was important to demonstrate the suitability of initiatives. Recognition that the majority of data were qualitative in nature and the project was in the form of self-reported action research highlighted the need to ensure credibility of evidence of student learning changes and relationships and activities within the course team. Validity of qualitative data, to confer credibility, must be supported and open to critical review. The measures used to achieve these ends included:

1. Triangulation of data from different sources.
2. Review and agreement of all interview data by interviewees.
3. Critical review by peers.
4. Verification of written reports.

This is a fairly brief account of a project that has been underway for over five years. Nevertheless, sufficient information has been given to establish the importance of perspective transformation in faculty development activities and to show that marked changes of attitude took place within this project. The other facet that has been highlighted in this account of the case study is the use of interpretive evaluation data. The SPQ and interview data presented here served as an invaluable diagnostic tool to the department to point to aspects of the original course that needed to be restructured. The marked change to the data for the initial intake to the degree course indicated that the changes were beneficial and provided a stimulus to continue with the project.

Change and Change Agents

It is clear from the case study presented in this article that improving the quality of teaching resulted from a major curriculum design change and that this was contingent upon a substantial shift in the attitudes of faculty within the department. Action research is clearly the appropriate method to employ, for it is the one research method that seeks to bring about change and improvement in social situations. Also important is that it incorporates the process of critical discourse to bring about change to the underlying attitudes of those who participate in it. Without this shift it would not have been possible to devise and implement the revised curriculum.

The case study also shows the inter-working of the formal system for quality assurance with the faculty development initiatives toward quality enhancement. The formal quality assurance mechanism of program accreditation was the catalyst for changes associated with this study. Failure at accreditation provided the opportunity for the members of this program team to review the situation in light of the increasing demands being made upon the institution and to take charge of a process in which previously they had been passive associates.

However, the quality assurance process was not in itself sufficient to bring about an improvement in the quality of teaching and learning. The initial phase of the study provided evidence that, though change was possible, it required support in changing the structure of the teaching program and for faculty development if it was to be implemented successfully.

The case study also shows the effectiveness of a partnership between a faculty developer, acting as a critical friend, and a concerned activist within the faculty. Initially, it is essential to have at least one person inside a faculty who is working actively to bring about change, for it is only the faculty themselves who can institute the change. The faculty developer then assumes the role of critical friend advising upon the initiatives. In most institutions there are only a small number of faculty developers who can afford to devote only limited amounts of time to each department, yet significant change takes considerable time and effort to bring about.

Summary and Conclusion

In this article we have advocated participation in educational action research projects as a mode of faculty development. The characteristics we envisage for this means of faculty development have been intermeshed with a discussion of pretexts and paradigms. To clarify our position, we will summarize the elements that characterize this vision of educational action research.

1. Project teams are composed of small groups who share a similar interest or concern.
2. The topic for the project is defined by the participants to fit within the broad aim of investigating and improving some aspect of their own teaching.
3. Project groups meet regularly to report observations and critique their own practices. This discourse provides for the possibility of perspective transformation.
4. Projects proceed through cycles of planning, action, observation, and reflection. At least two cycles are normally necessary to implement and refine any innovatory practices. The time scale for the cycles is consistent with the extended period necessary for perspective transformation.
5. Evidence of the effectiveness of teaching practices and their influence on student learning outcomes are gathered using interpretive methods.
6. The evidence gathered can be used to convince departmental colleagues not originally participating in the project that they too should change their practices and the curriculum.
7. Lessons learned from the projects can be disseminated to a wider audience through publications. Participants are therefore eligible for rewards through the traditional value system of universities.

The final listed characteristic of educational action research projects is an important facet of our conclusion. The approach to faculty development we have described treats quality enhancement of teaching as an academic venture consistent with the manner in which faculty are accustomed to conduct research in their discipline. Faculty are encouraged and empowered to assume responsibility for standards and quality enhancement of their own teaching.

The case study shows the interplay between the course approval mechanism as a quality assurance measure and the action research project, which dealt with quality enhancement. Refusal of the validation panel to allow the initial degree proposal to proceed gave an opportunity for the action research project to develop its bounds from an individual course to the complete program and to embrace the entire department. The institution's quality assurance system was important in providing this opening, but it is significant that its contribution was to forbid progress to the initial proposed course. The transformation of the department and the curriculum resulted from a quality enhancement initiative in the form of an educational action research project.

Quality, and in particular quality of teaching, is currently a major concern of many universities and state boards. In this article we have described a mode of faculty development that enables institutions to translate this concern into action. An important feature of the educational action research projects is that institutions avoid imposing yet another regulatory mechanism and instead empower teachers toward quality enhancement.

APPENDIX

The Action Learning Project

The case study described is one of a number of action research projects undertaken within our institution. Development of an action research approach to faculty development was itself an action research project on a different level. The critical friends employed the iterative and cyclical processes of action research to develop and refine appropriate strategies for initiating and supporting action research projects that were also faculty development projects.

The experience and expertise developed within the one institution served as the framework for a proposal for a collaborative project for educational action research projects in the seven universities in Hong Kong. A grant was obtained from the University Grants Committee of Hong Kong for a project that is known as the "Action Learning Project." The project aims to encourage and support academics in all seven universities to participate in action research projects concerned with aspects of their own teaching.

Action Learning Project Fund

The Action Learning Project currently supports fifty subprojects that fit within the overall project theme. Each subproject is an action research project by a group of academic staff. Each subproject has its own focus, which is consistent with the overall project goal of enhancing the quality of student learning by improving the quality of teaching.

Groups in each of the universities were invited to submit proposals for funding from an Action Learning Project Fund. The Project Coordinator was available to assist teams in forming proposals.

Funds awarded are used for purposes such as:

- Hiring support staff such as research assistants.
- Hiring temporary teaching staff to relieve full-time academics from teaching commitments so that they could work on the project.
- Equipment or materials.

Workshops were held to give guidelines for making proposals and conducting projects. These also aimed to raise awareness of action research as a process for improving teaching quality. Contributions were made by academics who have been involved in earlier action research projects. Booklets were also prepared to explain the processes of action learning and to suggest types of projects which might be suitable.

The Action Learning Project has a small team of "critical friends" who support and participate in the fifty subprojects. The involvement of the critical friend varies from project to project, and defining the role has been an evolving process. The critical friends have an initial meeting with each subproject and negotiate the level and type of involvement. The most common need, by far, has been advice and assistance with evaluation strategies.

Outcomes

The aim of the overall Action Learning Project is to develop a mechanism for improving teaching quality and for academic staff development that can be used in all Hong Kong universities. Dissemination of ideas and information from the supported subprojects is therefore an important facet of the overall project. A series of seminars has already been started, and each subproject team will be asked to give a seminar to describe its project and the lessons learned from it.

Each subproject will also contribute a case study. In this way, a bank of case studies of action research projects for a range of discipline areas will be developed. The case studies should cover a wide variety of teaching initiatives. Case study results are likely to be directly applicable from one institution to another. The case studies will be used to suggest ideas for further initiatives by those not initially involved. Toward the end of the project a conference will be held which will give all project teams the opportunity to report on their projects. This conference will be open to other academic staff so as to widely disseminate findings from the projects.

The overall aim of the project is to create a climate in which academic departments accept the need to monitor continuously and seek to improve the quality of teaching and of the courses offered. Involvement in action research projects is expected to develop attitudes so that the need for monitoring and development is accepted. The involvement will also develop the capacity of academic staff to monitor and evaluate their own teaching.

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The Development of Salary Goal Modeling

From Regression Analysis to a Value-Based Prescriptive Approach

Introduction

The complex institutional issue of faculty salary equity has legal, financial, and personal ramifications [2, 10, 22, 29]. Of course, any effective faculty reward system should be part of an institution's strategic planning process [10] and should reflect the institution's culture [30]. Ideally, equity systems should be responsive to organizational, interpersonal, and market factors [9, 10, 28, 29] as well as the political circumstances operating within the institution [30, 31]. From a more general perspective, Cascio maintains, "The dominant concern among compensation managers for the 1990s and beyond is how the compensation system links with organization and human resource strategies" [6, p. 422]. In spite of this acknowledged need for a comprehensive, planned approach, many institutions have responded to faculty equity issues in an ad hoc, reactionary manner [10]. This approach results in a variety of serious negative consequences including litigation, inefficient use of human resources, morale and productivity problems, and a violation of the ethical treatment of employees [6, 7, 10, 21, 27]. The purpose of this article is to describe how our institution, Frostburg State University [FSU], transformed a multiple regression approach to equity into a value-based prescriptive process of developing faculty salary goals. The historical setting and the formation of the task force will be described, followed by an examination of the issues, values, and factors used to design the model. Finally, applications of the model are presented.

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Institutional Characteristics and Setting

Frostburg State is a regional comprehensive university located in rural northwestern Maryland. The university enrolled more than forty-six hundred undergraduate students and more than eight hundred graduate students in 1994. Its undergraduates were predominantly full-time (89%), while its graduate students were largely part-time students (81%). The institution employed 244 full-time faculty in academic year 1994–95. Following the relatively common path of development from teacher's college to liberal arts college to comprehensive university, FSU has, for at least the past twenty-five years, continuously emphasized teaching as the primary role of faculty. Across three major revisions of its faculty evaluation system between 1971 and 1995 the university placed substantially greater weight upon teaching than upon other categories of evaluation, such as scholarship and service.[1] Further, demonstrated excellence in teaching is the institution's primary criterion for promotion to the upper faculty ranks. The institution's emphasis on the teaching role has been expressed as well in long-standing efforts to sustain small-to-moderate class sizes. For example, in 1994–95, 85% of all classes enrolled 30 or fewer students, and the modal class size was 18 students. Student-faculty ratios have been relatively stable, ranging between 16 to 1 and 18 to 1.

Like other rural institutions, Frostburg has had to cope with a particular economic pressure unlike those facing urban and/or doctorate-granting institutions: the dearth of qualified part-time faculty and/or graduate teaching assistants. Getz and Siegfried [16] have described a national trend to substitute part-time for full-time faculty in the face of the rising costs of higher education. Rural universities cannot resort to this cost reduction strategy to the degree available to nonrural institutions. The outcome for FSU has been a heavy reliance on the most expensive form of staffing — full-time, fully benefited faculty. In the sciences, for example, in 1994–95 full-time faculty taught 90% of all science classes. The resulting high proportion and high numbers of full-time teaching faculty have placed great pressure on faculty salaries because the available funds are distributed among a larger-than-normal number of full- time faculty, especially when compared to other schools in the University of Maryland System. Further, reductions in state supported funding during the 1990–93 economic downturn [11] placed the institution's faculty in a significantly depressed salary position relative to national norms. For example, Frostburg's full professors, on average, were $5,365 below AAUP's Category IIA average salary for this rank in 1994–95.

History of Salary Equity at Frostburg

During the late 1980s, our institution was characterized by growing concerns about equity and diversity issues. Nationally, women faculty were being compensated at a lower rate than their male counterparts at all academic ranks [e.g., 1, 21, 29, 30]. Moreover, in some studies these differences occurred even when other variables (such as career experience, seniority, and teaching discipline) were taken into account [21, 29, 30]. Thus, the original impetus for our salary equity efforts centered primarily around discussions of gender equity issues.

Examination of equity issues soon demonstrated, however, that inequity may result from additional, gender-neutral, causes. For instance, funds available for new faculty hires varied considerably from year to year due to political and economic factors [15, 28]. These differences in entry-level salaries were then magnified by subsequent cost-of-living adjustments, creating further inequity. Thus, Frostburg State University decided in 1988 to conduct a comprehensive examination of faculty salary equity that would include, but also extend beyond, gender and race equity issues.

Beginning in 1988, attempts at achieving salary equity on our campus were approached by utilizing two descriptive multiple regression models. These were developed and utilized four out of six years from 1988 to 1993, in spite of severe budgetary constraints during three of those six years. The variable selection was done by the deans[2] on the basis of measured data that had been historically included in faculty evaluation, longevity measures, and academic credentials.

$$\begin{aligned} \text{1988 Model: salary} &= f[\text{rank, (post doctoral years + total years at FSU)/2,} \\ &\quad \text{global measure of merit history}] \\ R^2 &= 0.72 \end{aligned}$$

Merit measures are significantly absent from most literature on faculty salary equity [e.g., 1, 5]. Moore [22] states that mathematical models are often applied to politically charged issues in the hope that the model frees the process of human bias. Further, she contends, "The absence of productivity or merit measures after almost 20 years of salary equity research is particularly disturbing. Differentials between males and females are often 'explained' away on the basis of these factors without ever measuring them" [22, p. 123]. Additionally, she explains that although actual salary decisions are made on the basis of merit information, this information is not included in the salary equity data base. For example, in a study by Bereman and Scott [1] the omission of merit data was due to the unavailability of this information.

Frostburg State University's 1988 regression model had higher explanatory power (R^2 = 0.72] than those reported in previous research. For instance, in describing regression analyses of faculty salaries, Braskamp, Muffo, and Langston [4] reported that most studies show R^2 values between 0.56 and 0.67. During the period used for analysis, all academic departments used an identical teaching evaluation instrument and a mechanical [checklist type] evaluation procedure, so that overall evaluation scores were comparable. The authors now attribute Frostburg State University's relative success with the 1988 model to the availability of standardized cross-department evaluation data reflecting merit history.

Following a two and one-half-year break for state-mandated budget freezes and cuts, Frostburg State University's equity effort resumed in spring of 1993 with the full support of its president. The deans and interim vice president for academic affairs developed an improved model based on statistical considerations and qualitative judgments derived from their previous experiences with equity reviews.

> 1993 Model: salary = *f*(rank, years in rank, merit history, discipline market conditions, academic degrees)[3]
>
> $R^2 = 0.88$

In applying this model, the deans used the known degree of statistical error in the model to establish a lower limit for predicted individual faculty salaries and to focus salary adjustments on those faculty whose salaries were below "scale" as defined by this lower limit. In 1993, with the approval of the institution's president, approximately 25% of funds available for discretionary salary adjustments were used for salary equity increments.

From the Deans to the Task Force

Although the descriptive power of this 1993 effort was gratifying, the deans were not fully satisfied with all elements of the process nor with the outcomes. Some department chairs questioned the model from a prescriptive standpoint. They questioned the capacity of this (or any) statistical model to produce a "fair" outcome, especially when they disagreed with the recommended adjustments for individual faculty. In addition, the deans and department chairs found multiple regression difficult to explain to faculty who lacked backgrounds in statistics [1]. A number of department chairs, in the face of the complexities involved in trying to explain outcomes to their faculty, were not inclined to defend the approach. Further, those who were statistically sophisticated raised the issue of multicollinearity[4] and remained skeptical even in the face of strong statistical arguments and evidence that the effect of multicollinearity on such studies is minimal [e.g., 20].

The deans who developed the 1993 model believed that the variables, the scaling, and the process were as balanced and objective as possible. Yet they realized that this approach included implicit values that had not been agreed to as important to all faculty and that many issues remained unresolved at the institutional level. For example, the issue of market value as it relates to discipline had not been resolved. Furthermore, there had been long-term inconsistencies in the determination of starting salaries and promotion adjustments. Additionally, a faculty committee was enmeshed in an attempt to resolve a significant split among faculty with regard to recommendations to regularize promotion adjustments.

Although the descriptive regression models were able to capture historical inequities based on historical evaluation and reward processes, the deans wished to revisit the approach to equity adjustments for the reasons described above and because of changes in the faculty evaluation system. The evaluation system had, by this time, become a decentralized, department-specific process that prohibited confident comparisons across departments. As Moore points out, "Human judgment is an inherent part of any statistical method. Resorting to statistical methods may serve political interests by removing from public view the arena in which judgment is exercised but never by removing the necessity for making those judgments" [22, p. 107].

In spite of the satisfactory outcome of the 1993 study [see Table 5 on page 571], the deans agreed that issues and alternative solutions to salary equity should be more completely reviewed with the hope that a more acceptable process could be devised. They wanted to engage representative and concerned faculty in a more extensive discussion of, and reflection on, equity issues and solutions.[5]

At the center of concern for more extensive reflection on the issues lay an awareness that faculty, especially those of long service, believed that equity funds needed not only to be distributed "fairly," but also used to remedy a wide variety of past "inequities." "Fair" distribution has been generally accepted at Frostburg State to mean in accordance with clear criteria that reflect what had been defined as meritorious: accomplishment (consisting of academic degrees and performance), merit awards, and longevity. Expectations of faculty accomplishments (qualifications and performance) had shifted as the institution expanded and new faculty joined the institution. The concept of what would be "equitable" varied among a faculty who had experienced changes in institutional structures, administration, governance, and, especially, evaluation criteria and standards. Finnegan [15] recently described these faculty cohort changes in comprehensive institutions as outcomes of the interactions between academic market dynamics and evolving institutional missions and goals.

Entering the 1993–94 academic year, Frostburg's president supported our continuing the comprehensive equity efforts. This support was especially important because during three years of state-mandated budget cuts, minimal or no increases in salary, and an unpaid "furlough," faculty had begun to believe that their professional (and personal) worth had been assaulted by the state's priorities and funding decisions, an assault that went beyond gender issues. In addition, predictions by such writers as Bowen and Sosa [3] that fewer new PhDs would be available than faculty vacancies by the late 1990s intensified our concerns about our institution's future competitiveness. In 1993 the specter of increasing competition for excellent teaching faculty weighed especially heavily on us, because we were already in depressed salary circumstances by national standards.

A need to continue equity efforts, along with a desire to improve the process, led to the formation of a Salary Equity Task Force in fall 1993. In addition to the school deans, the task force consisted of a female and male faculty member from each school. Academic disciplines represented included business administration, communication and theatre arts, economics, education, health and physical education, history, physics, and psychology. All eight faculty, conscientious and aware of depressed morale, were able to step back from their own current pressing economic concerns and examine equity issues on behalf of colleagues and in the interests of future faculty hires. The group quickly reached the conclusion that the values central to establishing salary equity must be explored [13, 22, 27, 28, 30].

The work of the group was given additional impetus in 1993 when the University of Maryland System [UMS] Board of Regents announced a policy seeking to fund substantial improvements in UMS institutions' faculty salaries. The task force members believed the development of a faculty-supported and administration-approved approach to salary equity for all faculty, in advance of the funding for the regent's initiative, would be of strategic importance to the university.

Key Issues Developed by the Task Force

Through energetic debate over a seven-month period the working group concluded that any acceptable equity review model would resolve the following key, value-centered issues: [1] school and department variations in evaluation criteria and processes; [2] discipline differences in salary level in the national academic market; [3] impact of entry level salaries on the evolution of inequities; [4] inequities created by year-to- year fluctuations in available funding for merit increases; [5] lack of a consistent approach to salary adjustments upon promotion in rank; [6] historical descriptive statistical analysis (regression) versus prescriptive value-centered modeling. The group's resolution of each of these issues is briefly presented below.

School and Department Evaluation Standards

Most organizations in this country have merit-based compensation systems [17]. Central to such an effective system is a reliable, valid, and acceptable performance evaluation procedure [6, 25, 26, 27]. Employees must believe that their performance is being evaluated fairly, and they require that the process of evaluation be articulated clearly [17]. Nonetheless, performance appraisals are often subjective, and evaluation criteria can be both deficient and contaminated [6, 23, 27]. Moreover, employee evaluation may occur in institutional or organizational contexts that are not rational, straightforward, or dispassionate [20]. Participants in the evaluation process are intensely aware of the practical and political implications of evaluation data and are frequently ill at ease with the process [6]. Longenecker et al. [20] found that political considerations nearly always influence the evaluation process and that an employee's evaluations might be either inflated or deflated based on "rater discretion."

The political and interpersonal nature of evaluation has been keenly felt at Frostburg State University. In fact, concerns about departmental and school evaluation process remained one of the most difficult issues faced by the task force. In the earlier salary equity work [1988–90] the institution had available historical evaluation data that included common cross-department and cross-school measures. By the time the equity effort resumed in 1993, a new, more department-centered faculty evaluation process had been implemented. This new process had the advantage of being more sensitive to differences among disciplines, but the use of departmentally determined measures and interpretations of the new system's common criteria made direct comparisons across departments extremely risky. To compound the problem, faculty leaders had complained that evaluation standards were not being applied as stringently in some schools as in others and that political agendas were being infused into the application of the evaluation system. They argued that an evaluation bias was operating and that merit evaluations did not reflect performance differences because the criteria were applied inconsistently.

The task force's work almost came to a standstill over building an equity model on inconsistent evaluation processes. The prevailing view noted that the "evaluation problem" had to be solved before moving forward with a prescriptive salary equity program. Faced by the political reality that any substantial reform in the faculty evaluation system would entail a three to five year process, the Task Force decided to employ salary equity recommendations to create additional pressure for appropriate evaluation changes. Following this decision, the readiness to design a prescriptive model improved dramatically. The evaluation problem had been turned on its head! The task force then decided to standardize faculty merit history by scaling it within the new equity model. This allowed each faculty member to retain her or his merit history position relative to other faculty in the school. The schools (school deans and academic departments) would be responsible for resolving departmental differences in measuring merit. However, the task force continued to stress the importance of reexamining the institution's faculty evaluation system.[6]

Discipline Differences

Maintaining the institution's capacity to recruit and retain competitive faculty is very difficult when many faculty reject the legitimacy of academic marketplace values. This issue can become personal and intensely emotional, especially in small or middle-sized institutions, where faculty from different departments interact and often share common university work assignments. This problem is complicated because faculty see themselves (and their salaries, etc.) in several frames of reference — including institutional, departmental, and professional contexts. Thus, the "fairness" of a salary viewed from an institutional perspective is different from the "fairness" of that same salary viewed in the context of one's department or discipline.

Many of the philosophical and pragmatic dimensions of this "competition versus collegiality" dilemma have been described in a comprehensive review by Scott and Bereman [28], who point out that higher education often values internal consistency over external competitiveness. Nichols-Casebolt [24] articulates the dilemma by stating that institutions must decide how to distribute scarce resources based on market demands while preserving faculty morale. The work of these researchers places our concerns about discipline differences in a larger social and professional context. Frostburg's 1988 model had excluded academic discipline as a factor, but the 1993 model included a discipline factor index based on salary data from the American Association of State Colleges and Universities/College and University Personnel

Association (AASCU/CUPA). The discipline factor index was the ratio of discipline average salary to the overall AASCU/CUPA average salary. Measuring discipline differences on a ratio scale placed less than full weight on disciplinary salary differences within the 1993 regression model.

After intense discussion among the Task Force members, an underlying position of principle emerged — all students in all programs deserved an education provided by faculty whose credentials, experience, and skills were of an equally high order. This meant that all academic programs must have an opportunity to be nationally competitive with A.A.S.C.U. institutions in regard to current and new faculty salaries. Consequently, the 1993–94 Task Force decided that the prescriptive model should fully include discipline differences. They felt it was likely that there would be a long-term negative impact on students should the institution fail to be competitive in all disciplines. Nevertheless, the authors note that future pressures for greater internal consistency may lead the institution to reverse course on this issue.

Entry Level Salaries

Each year political and economic realities impact available funding for salaries and operating budgets at public academic institutions [15, 28]. As noted earlier, these fluctuations directly impact the resources available for the entry-level salaries of new faculty hires, whose initial salary differences are subsequently compounded by percentage cost-of-living adjustments and create salary inequities. To prevent this type of inequity, the task force established entry-level minimum salaries for each rank in each academic discipline for all faculty who hold the terminal degree. These salaries are updated annually and serve as guides for new hires. The goal is to preclude the development of equity problems originating in noncompetitive entry-level salaries.

Year-to-Year Fluctuations in Merit Funds

Most faculty in public institutions have experienced boom-and- bust economic swings. The problem these fluctuations present for salary equity lies in the unpredictable coincidences of strong, mediocre, or weak evaluation years with the availability of greater or lesser merit funds. The task force attacked this problem through the use of a smoothing technique, shown below, which uses a weighted four-year average for the merit evaluation factor in the equity model.

$$\mathrm{AMEF}_t = [(Y_{t-1} \cdot 0.4) + (Y_{t-2} \cdot 0.3) + (Y_{t-3} \cdot 0.2) + (Y_{t-4} \cdot 0.1)]$$

where AMEF_t = average merit evaluation factor at time t; and Y_{t-n} = numerical evaluation rating for faculty member for the preceding four evaluation years.

This technique dampens to some degree the impact of year-to- year budget swings. Placing the greatest weight on the most recent year's evaluation and annually updating the merit history creates incentives for faculty to continue to perform at a high level.

Promotion Increases

A standing committee [Faculty Concerns] of the faculty senate debated the initiation of standard salary increases upon promotion to the associate professor and professor ranks. The committee gridlocked over the timing of this policy change. The problem was the assurance of equity for faculty recently promoted but who had received no salary increase and who would not receive the benefit of the new policy. The standing committee failed to agree on a process for handling retroactive promotion increases. As the task force's salary goals recommendations evolved, it became clear that standard promotion increases filled a natural niche in the overall model. Further, because the model imbeds increased salary goals for each successive academic rank, it was directly addressing the salary problem for those faculty who had been promoted prior to the change in policy. After reviewing the task force's solution, the deadlocked faculty committee formally endorsed this approach to the issue and reported their endorsement to the chairs' council and the faculty senate.

Historical-Descriptive versus Prescriptive Value-Centered Modeling

The task force discussed at length the possibility that the outcomes of statistical analysis in general, and regression analysis in particular, might be seriously contaminated. For example, results might be biased by missing variables; rank at hire and/or entry level salary; or inconsistencies in promotions (see [1, 5, and 22] for discussions of problems with the use of multiple regression in evaluating faculty salary equity). Nevertheless, the task force decided that the historical descriptive model would be useful as a base on which to build a value-centered prescriptive model. In designing this prescriptive model, the group would explore equity issues, identify values, and determine factors that would reflect the desired values. These factors were determined after the group agreed on five primary institutional values: excellence in teaching, traditional scholarship and the scholarship of teaching, protection of long term salary, reward for productivity including service to the university and community, and institutional competitiveness in the recruitment and retention of faculty. The goal was to devise a model that would (1) reward performance in these valued areas, (2) be understood by most faculty, and (3) result in outcomes acceptable to most faculty when applied.

The factors included in the prescriptive value-centered model are merit, rank, discipline differences, and years in rank. These factors are reflective and measurable indicators of the above values deemed important by the task force.

> 1994 Model: salary goal ($) = *f*(merit, rank, discipline differences, years in rank)

TABLE 1

1994 Salary Goals Factors and Values Represented

Factor	Values Represented
Merit evaluations	Recent teaching performance Recent scholarship Recent quality of service
Rank	Long-term teaching excellence Long-term scholarship Long-term quality of service
Years in rank	Long-term salary protection (not already imbedded in rank)
Discipline differences	Institutional competitiveness in faculty recruitment and retention

The task force argued that quality of performance should be rewarded more heavily than longevity in a prescriptive equity model. At Frostburg, cost-of-living adjustments had far outweighed merit and equity adjustments combined. As a consequence, the task force thought that overall years in service had been historically rewarded and that inconsistent reward for accomplishment was a source of inequity. The group decided to tilt the balance toward recent meritorious performance and give more weight to an annually updated summative measure of merit and less weight to years of experience than was given in the earlier regression models. This reduces the compounding of existing salary differences that had resulted from the state's percentage-based cost-of-living adjustments. The full impact of this approach, of course, will only be realized when funding for merit/equity pay adjustments outweighs percentage-based cost-of-living adjustments.

The task force retained academic rank as a factor in the value-centered model because, absent evidence of past bias in promotions, a faculty member's rank represents a summary of the value of that person's accomplishments and professional contributions to the university. The previous descriptive models had established that a faculty member's rank subsumed much of the "years of experience" variable and that a lesser variable — years in rank — accounted sufficiently for the remaining experience differences. Furthermore, because years in previous rank(s) serve as one of the criteria for promotion, longevity is already reflected to a substantial degree in a faculty member's rank. Because rank represents both quality of performance [30] and length of service, the group judged it a legitimate and appropriate factor in equity evaluations. Any suspected past bias in promotions, of course, should be reviewed, evaluated, and corrected independently of the salary equity model an institution develops.

Much debate centered around the extent to which the institution should balance market influences in faculty salary with internal consistency and faculty morale. Eventually, the task force decided to include discipline differences as a factor in the prescriptive model. This decision was based on the fundamental value that, to the extent possible, all students deserve to be educated by faculty of equally high skills, training, and experience.

Following the lead of such writers as Dutton and Bissonnette [10] and Snyder et al. [30], and drawing upon five years of experience with equity issues, the task force developed a salary goals model that now will be applied annually both to address historical inequities and to help prevent the development of new inequities. This model included those factors that reflected our task force's perception of our desired institutional values.

The task force presented its report, entitled "Salary Goals," to the Academic Department Chairs' Council in the spring of 1994, gaining unanimous endorsement by that group. Shortly thereafter the proposed process gained support from the provost and approval by the president. The president then directed that institutional discretionary funds be committed so that all of the "below goal" faculty would receive salary adjustments that placed them within the lower limit of the university's 1994 target for individual salary goals.[7]

The swift approval can be attributed to the fact that the application of the process and the resulting final model revealed a number of consistencies with suggestions made in the faculty salary equity literature. First, Risher (cited in Bereman & Scott, [1, pp. 556–557]) articulates a set of criteria for equity techniques. Frostburg's Salary Goals model is responsive to his criteria in that (1) it avoids the statistical and interpretive problems of multiple regression, (2) it accounts for salary differentials based on rank and discipline, (3) it includes merit and years in rank, (4) it includes market considerations, (5) it is flexible enough to be used in a variety of contexts, such as comprehensively reviewing salaries, establishing salaries for new hires, and statistically evaluating specific equity issues. Further, this process confronts openly the issues of institutional values as advised by Moore [22]. Finally, it is designed to be integrated with long-term planning and reflects a synthesis of organizational, environmental and interpersonal factors, as suggested by Dutton and Bissonnette [10] and Diamond [9], respectively.

The 1994 Salary Goals Model

The 1994 salary goals model is comprised of a matrix representing each rank with variations for discipline competitiveness, years in rank, and merit history. Figure 1 depicts a conceptual framework for the model.

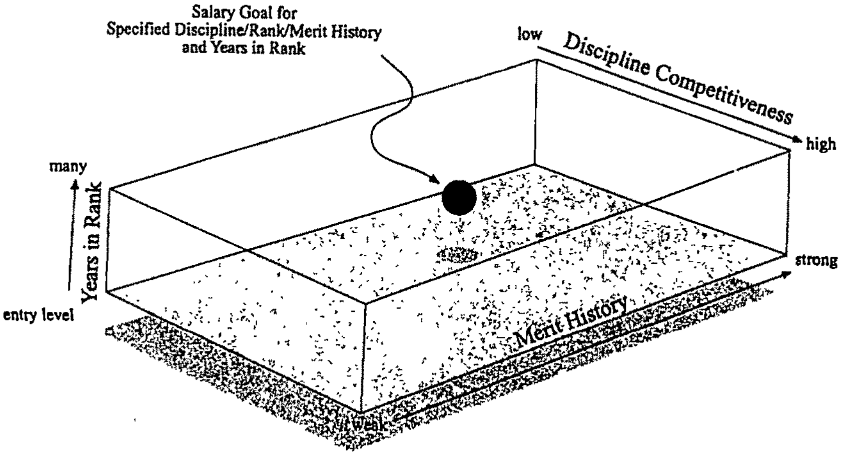

FIG. 1. Salary Goals Model

NOTE: Dimensions depict greater weight on merit history and discipline competitiveness than years in rank.

The model is implemented through the generation of a salary goal table for each of the three ranks in every discipline area. Seventy-eight rank-by-discipline tables were produced for 26 academic disciplines.[8] Table 2 presents the lower, pivotal, and upper limits of examples of these tables representing three academic disciplines. For instance, an associate professor of economics with five years in rank and a merit history value of 3.0 would have a salary goal target of $50,850. Similarly, an associate professor of philosophy with five years in rank and a merit history value of 3.0 would have a salary goal target of $44,850. A complete rank-discipline salary goals table includes salary entries for each year-in-rank and for as many points along the merit scale as is considered necessary to represent merit performance differences (e.g., in 0.1, 0.25, etc., intervals).

Applying the Model

Comprehensive Salary Review

For each faculty member all of the relevant individual data are collated and entered into a salary review spreadsheet. The spreadsheet in-

TABLE 2

Lower Pivotal, and Upper Parameters of 1995 Salary Goals Tables for Three Representative Disciplines

	Philosophy				Economics				Physics			
	Years in Rank	Merit History			Years in Rank	Merit History			Years in Rank	Merit History		
Assistant professor		0.00	1.50	3.00		0.00	1.50	3.00		0.00	1.50	3.00
	0	30.60	32.70	34.80	0	39.90	42.00	44.10	0	34.80	36.90	39.00
	4	30.60	33.50[a]	35.60	4	39.90	42.80[a]	44.90	4	34.80	37.70[a]	39.80
	8	30.60	34.30	36.40	8	39.90	43.60	45.70	8	34.80	38.50	40.60
Associate professor		0.00	1.75	3.00		0.00	1.75	3.00		0.00	1.75	3.00
	0	39.70	42.10	43.90	0	45.70	48.10	49.90	0	42.90	45.40	47.10
	5	39.70	43.10[a]	44.90	5	45.70	49.10[a]	50.90	5	42.90	46.40[a]	48.10
	10	39.70	44.10	45.90	10	45.70	50.10	51.90	10	42.90	47.40	49.10
Professor		0.00	2.25	3.00		0.00	2.25	3.00		0.00	2.25	3.00
	0	53.00	56.20	57.30	0	56.20	59.30	60.40	0	55.70	58.80	59.90
	11	53.00	58.40[a]	59.50	11	56.20	61.50[a]	62.60	11	55.70	61.00[a]	62.10
	22	53.00	60.60	61.70	22	56.20	63.70	64.80	22	55.70	63.20	64.30

[a] Pivot Point: As defined by average AASCU/CUPA salary, expected merit history, and median years in rank. Note that because the discipline averages are market-determined, the pattern of salary progression for rank is not consistent across disciplines. Salaries are prescribed in thousand dollar units.

cludes current salary and all salary adjustments that apply to each faculty member (e.g., cost-of-living, current year merit increment, promotion). The faculty member's projected salary is compared to the applicable salary goal or a lower limit percentage of that goal. The institution, of course, must set a total salary adjustments funding level affordable in the upcoming budget year. Frostburg set a lower limit of 90% of salary goal in the first year using the prescriptive model (1994) and the task force recommended a lower limit of 95% of salary goal for the second year's application (1995). This approach tackles the most egregious salary deficits first and moves the institution closer to equitable salaries in a planned, goal-oriented, and policy- supported, manner. A similar "percent-of-goal" approach ["Compa- Ratio"] applied to the detection of gender bias has been described by Bereman and Scott [1]. Frostburg's model includes multiple variables in defining faculty salary goals, thus refining the Bereman and Scott process.

To enhance the faculty leadership's support for the process the department chairs were given an opportunity to evaluate the proposed salary adjustments for faculty in the chair's department before the dean recommended implementing such adjustments. All department chairs, having reviewed and endorsed the salary goals process, recommended no changes in the individual salary adjustments generated by the 1994 salary goals model. This response contrasts strongly with some department chairs' negative reactions to the earlier equity salary adjustments that had been generated through regression modeling. While the model is less complex than such comprehensive multiple regression models as Fairweather's 1995 work [14], the fact that the recommendations for salary adjustments met with no opposition is significant. Briefly put, this outcome indicates that the model generated outcomes that were viewed as "fair" by our twenty-four department chairs.

New Hires

Deans and chairs apply the information in the tables to the planning of salary ranges for new hires. For example, a new economics assistant professor hire could be planned as a $41,000 to S43,000 hire — a range found within the first row of the applicable salary goals table. In nearly all disciplines the salaries listed along our entry level rows overlap with the "new assistant professor" salaries reported by AASCU/CUPA. The exceptions are those disciplines currently operating under salary inversion pressures (such as accounting and selected business subfields). An institution's decision to hire new assistant professors at salaries above their previously hired assistant professors must, of course, be weighed carefully because of the potential generation of equity and morale issues under these circumstances. Our institution currently avoids hiring inexperienced new PhDs at salary levels above our existing personnel. New hires with a documented experience and performance record can, of course, be placed within higher segments of the applicable table upon departmental justification and recommendation — after the department has carefully considered the case and decided that the recommended salary is equitable to all parties.

Specific Equity Reviews

The salary goals tables lend themselves directly to the review of specific equity issues. For example, a study of gender equity in salaries would compare the salaries of female and male faculty to the individual salary goals within departments, within schools, or university-wide, whichever case is at issue. The proportions of all university female and male faculty who fell below salary goal in 1994 are presented in Table 3. A similar intraschool example is shown in Table 4.

Although the proportion of female faculty below salary goal was somewhat lower than for males, chi-square analysis [18] of these frequencies did not demonstrate that the difference was statistically significant (chi-square = 0.83, $p > 0.05$).

Although proportionally more female faculty were below goal in this school, these frequency differences were insignificant (chi-square = 0.19, $p > 0.05$). Table 5 presents descriptive statistical data comparing gender and minority status that indicate actual dollars above/below salary goal.

The data in Table 5 represent actual salaries in 1993 and 1994 relative to salary goals generated by the prescriptive salary goal model. The reader is reminded that the 1993 salary adjustments were determined through the use of the 1993 multiple regression model. The view that the 1993 multiple regression model had served the institution well with regard to salary equity is especially supported by the high degree of similarity between female and male salaries in the 1993 data. These 1993 gender comparisons show that our 1988 decision to address salary equity issues on behalf of all faculty [rather than women faculty only] had resulted in the elimination of the gap between female and male salaries. These results culminated four years of equity efforts using multiple regression procedures.

Because it could be argued that, in any equity model, bias against female or male faculty in the evaluation of merit could be masking salary inequity, the current authors also examined female versus male differences in merit history in the 1993 data. This analysis showed no difference based on gender (female mean = 4.45, male mean = 4.47 on a 1–5 scale with standard deviations of 0.23 and 0.26 respectively).

TABLE 3

University-wide Frequency (and Percent) of Female and Male Faculty Below versus At-or-Above 100% Salary Goal

	Below 100% Salary Goal	At-or-Above 100% Salary Goal
Female	41 (69.5)	18 (30.5)
Male	109 (75.7)	35 (24.3)

TABLE 4

A Within-School Comparison of Female and Male Faculty Below 100% Salary Goal

	Below 100% Salary Goal	At-or-Above 100% Salary Goal
Female	12 (80.0)	3 (20.0)
Male	44 (74.6)	15 (25.4)

TABLE 5

Dollars Above/Below 100 Percent Salary Goal by Gender and Minority Status: 1993 and 1994

	1993 Average	*SD*	1994 Average	*SD*
Female ($N = 59$)	–2,056	4,804	–848	4,421
Male ($N = 144$)	–2,050	4,559	–1,256	4,172
Minority ($N = 16$)	–1,740	5,233	–892	5,169
Nonminority ($N = 187$)	–2,078	4,575	–1,158	4,161
Total faculty ($N = 203$)	–2,051	4,631	–1,137	4,250

The 1994 data show that, on average, female and male faculty salaries continued to be comparable. Overall, and for all identified subgroups, the 1994 salaries are closer to goal as a result of the application of the salary goals model. From 1993 to 1994, among all subgroups, women had a slight (nonsignificant) salary gain advantage. To the extent that funding allows, the institution intends to continue to focus equity efforts on those faculty whose salaries are most below goal.

Discussion

In many respects our institution's salary efforts have paralleled the evolution of gender equity studies during the 1980s and 1990s. Ten years ago, the most frequent types of data reported and the data we examined at our institution were (1) rank-by-gender average salaries and (2) female salaries as a percentage of male salaries. As we and others became critical of such data, we moved to multivariate studies (especially multiple regression analyses) as an antidote to the then-emphasized oversimplified statistical analyses. Although multivariate analyses served as important correctives to the earlier studies, the underlying meanings represented by these more sophisticated numbers often were obscure and left many concerned professionals unsure whether these data were leading to appropriate solutions for salary equity problems.

In a sense, our 1993–94 work became an attempt to make the meanings (and values) which underlie our salary equity initiative clear enough for both faculty and administrative understanding and acceptance. Unlike our earlier statistical-analytic models (either the simple or complex ones) our 1994 model attempts to bring to the surface the relevant institutional values, develop faculty consensus on what the factors are that represent those values, and define an equitable salary as a salary that matches an individualized salary goal produced by this values-based process.

Many faculty (and administrators) appreciate the strengths of quantitative-statistical approaches and readily accept their application to such problems as salary equity. Perhaps a larger number of faculty actively mistrust statistical analyses and applications and especially difficult-to-comprehend, complex, statistical procedures. Nevertheless, for most faculty, salary equity is a matter of comparing one's own salary to the salaries of colleagues. We compare ourselves to our department colleagues, to university colleagues, or to disciplinary colleagues according to national norms. Each of these contexts for salary comparisons creates a different perception of equity.

Through developing a more explicit understanding of the implications of these multiple contexts for salary comparisons both prostatistical and antistatistical faculty can achieve consensus on a definition of salary equity and on a corrective process for their institution. The key steps in accomplishing this consensus are: (1) to make the common institutional values and goals explicit, (2) to establish which indicators relate to these common values, and (3) to design the system so that the weights placed on the indicators reflect institutional priorities.

Finally, we draw six basic conclusions from our work.

1. An explicit policy and process for regular (preferably, annual) salary review is critical.
2. Joint faculty and administrative involvement in developing the policy and process is essential.
3. The policy and process should offer the means to address existing salary inequities and the means to prevent, or at least dampen, the development of future inequities.

4. The institution must make funding of the salary goal process a high enough priority to insure at least steady progress (again, preferably annual) in reducing identified inequities.
5. The policy and process should balance the institution's interest in its faculty's morale with its interest in sustaining recruitment and retention competitiveness across disciplines.
6. Merit evaluations should be integrated as a factor within the salary equity model, and careful attention must be given to ensuring that the evaluation process is itself equitable across departments.

An institution that implements a salary equity process of the kind we describe above can, in good faith, say to its faculty:

> We define an equitable salary as that salary which reflects your long-term professional accomplishments, your recent history of meritorious performance, your years in your academic rank compared to your institutional colleagues, and the national standards for your academic discipline. Furthermore, we are committed to making every faculty member's salary as equitable as our resources permit.

Summary

This article describes the transition from a multiyear multiple regression approach to faculty salary equity to a prescriptive value-based approach for establishing salary goals. The original reasons for examining salary equity were varied and included gender equity issues. The formation of a task force and the resulting discussions of values led to a comprehensive approach that included, but went beyond, gender concerns. An important aspect of the development of the salary goals model was the process by which it was developed. The statistical regression models developed by the deans had been satisfactory to the deans in remedying historical inequity. However, after four applications of these models, they were uneasy about applying them for an indefinite period. The creation of a task force made up of faculty and school deans quickly reached the conclusion that any future equity issues should be dealt with by using a prescriptive approach, and that approach had to be based on accepted values. The task force explored issues related to the use of historical-statistical-descriptive models versus prescriptive, value-centered models; management of evaluative data; the impact of economic fluctuations on entry-level salaries and merit-fund availability; and the treatment of discipline differences. After concurring on a set of values and on measurement factors that reflected those values, the task force resolved differences and developed a prescriptive, value-centered, salary goals model. The model can be used for such practical applications as salary reviews, planning of salary ranges for new hires, and statistical description and evaluation of specific equity issues.

Notes

[1] An overview of these three evaluation systems is available from the first author upon request.

[2] Deans are the chief academic officers for each of four "schools." "Schools" are organizational units equivalent to "colleges" in other universities.

[3] Interested readers are invited to request a copy of the 1993 internal statistical report to Frostburg State University faculty describing the specifics of this model.

[4] Multicollinearity occurs when two or more predictors are highly correlated with each other and when the result is that more than one solution to the multiple regression equation occurs [7].

[5] A recent study by Nichols-Casebolt [20] demonstrates that faculty satisfaction with the outcomes of salary adjustments increases with their involvement in salary adjustment decisions. In addition, when employees are involved in the compensation process, they provide information and insights unavailable to the designers of the system [15].

[6] Two of our task force faculty are now assisting the institution with that process as members of the University's Faculty Evaluation Subcommittee.

[7] A conceptually similar salary equity review process for university professional staff was also initiated by the president in 1994.

[8] The detailed procedures for producing the salary goals tables are available from the first author upon request.

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Staying in College

Moderators of the Relation between Intention and Institutional Departure

Introduction

The present study tests hypotheses pertaining to moderators of the relation between intention and institutional departure. The hypotheses are derived from a review of the literature on college student departure, the theory of reasoned action [4], and Azjen's [3] conceptual analysis of the factors that cause intentions to degenerate.

Intention represents a determination to act in a certain way in the future [24]. Intention plays a key role in Bean's [9, 10] model of attrition because it is conceptualized as the most proximal determinant of institutional departure. This model of attrition has been applied successfully to diverse populations of college students [11, 12, 13, 22, 23]. Several studies have found that intention to leave is a significant predictor of subsequent attrition [8, 14, 15, 17, 22]. Nonetheless, for example, Metzner and Bean [23] found that intention to leave, grades, and 24 other predictor variables, in concert, accounted for only 29% of the variance in attrition. A bivariate analysis of data reported in Okun, Ruehlman, and Karoly [29] reveals that intention by itself explained only 13% of the variance in institutional departure. What accounts for the moderate relation between intention (to stay or transfer) and institutional persistence? The present study investigates the possibility that the magnitude of the relation between intention and subsequent enrollment behavior varies with (a) grades, (b) commitment, and (c) encouragement from others to stay.

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Review of the Literature

Grades. According to Bean [9], grades are an academic outcome, which can be conceptualized as quasi-economic rewards. Even when students dismissed for inadequate grades are eliminated, grades have been shown to predict persistence [2, 13, 31]. There is also some evidence that the relation between GPA and institutional departure may be nonlinear. Andrieu and St. John [5] reported that graduate students with intermediate GPAs had the highest rate of institutional departure. In studies with undergraduate samples, St. John and colleagues [37, 38] found that students with below "C" grades were more likely to persist than students with "B" grades, and students with "B" grades were more likely to persist than students with either mostly "C" grades or "A" grades. Therefore, in the present study, we examined whether semester GPA has a nonlinear effect on institutional departure.

Commitment. Tinto [40,41] theorized that commitment to the goal of attaining a degree (goal commitment) and commitment to one's college (institutional commitment) were proximal determinants of institutional departure. Empirical tests of the presumed linkages among the constructs of academic and social integration and goal and institutional commitment and between these constructs and persistence behavior have been equivocal [25, 26, 27, 32, 33]. More recently, Spanard [39] suggested that commitment to the college role needs to be assessed in the context of nonacademic roles. Consequently, in the present study, we defined commitment as the priority students place on doing well in college *relative* to goals associated with other roles.

Encouragement to stay. Lack of encouragement from others to stay is posited by Bean and Metzner [14] to be an important environmental variable which exerts both direct and indirect effects on institutional departure. Tinto [41] noted that memberships in external communities may be crucial to departure decisions, particularly for commuter students. External communities may affect institutional departure by exerting normative influence [8]. Normative influence occurs when individuals tell another person how they should or should not behave. Bank, Slavings, and Biddle [8] found that the social influence of parents and peers (but not faculty) had strong direct effects on institutional departure. Other studies confirm that encouragement from others affects the decision to depart [19, 26, 27, 28].

Intention. Recently, Cabrera, Nora, and Castañeda [18] developed and tested a causal model of college student persistence which integrated the theoretical frameworks proposed by Bean [9] and Tinto [40]. They included four variables from Bean's model (intention, GPA, financial attitudes, and encouragement from others) and four variables from Tinto's model (academic and social integration and goal and institutional commitment). Direct effects on attrition were predicted for intention, GPA, and financial attitudes, whereas indirect effects on attrition were predicted for encouragement from others, academic and social integration, and goal and institutional commitment. The results indicated that intention to persist and GPA were significant predictors of institutional persistence ($R^2 = 0.47$), and that institutional and goal commitment were significant predictors of intention to persist ($R^2 = 0.43$). In terms of total effects, the largest effects on persistence behavior were due to intention, GPA, institutional commitment, and encouragement from others, whereas the largest effects on intention were due to institutional commitment, encouragement from others, and goal commitment.

To date, researchers have largely ignored the issue of moderators of the intention-persistence behavior relation. Perhaps, this has occurred because the emphasis has been on testing causal models of college student departure which emanate from conceptual frameworks that do not specify such interaction effects. Furthermore, because researchers have tended to use techniques such as path analysis to test their hypotheses, they have paid little attention (a) to examining the linearity of the relations between predictors and institutional persistence; and (b) inspecting classification tables that show the error rates associated with the prediction of institutional departure.

Richards' [36] study, which was conducted on a sample of community college students who intended to stay, highlights the importance of considering nonlinear effects. He found that students enrolled for 1–3 credit hours had a much higher rate of institutional departure (69%) than students enrolled for 4–6 credit hours (31%) but that further increases in credit load did not further decrease institutional departure. In light of the threshold effect observed for credit load, in the present study we examined whether credit load was nonlinearly related to institutional departure. Furthermore, because credit load can be conceptualized as a material indicator of investment [29] and priority assigned to the goal of doing well in college can be conceptualized as a psychological indicator of investment, we also investigated whether commitment exhibited a nonlinear threshold effect on institutional departure.

The utility of examining cross-classification tables is illustrated by Okun et al. [29] who reported that 29% of the students who intended to stay subsequently departed, and 23% of the students who intended to transfer subsequently persisted. Thus, although intention was significantly associated with subsequent enrollment behavior, a substantial percentage of students engaged in "unplanned" departure as well as "unplanned" staying. These conditional percentages underscore the need to identify factors that moderate the relation between intention and persistence.

Conceptual Framework

The Theory of Reasoned Action

Ajzen and Fishbein [4] proposed the theory of reasoned action to account for the relation between attitudes and behavior. According to this theory, attitudes and subjective norms are the antecedents of intentions, and intentions, in turn, control actions. Attitudes represent a personal factor — whether an individual is favorably or unfavorably predisposed toward the behavior in question. Subjective norm is an interpersonal factor — the extent to which there is social pressure to perform or not perform the behavior. Generally speaking, when people evaluate a behavior positively and believe that important others think that they should do it, they intend to engage in the behavior. In many contexts, people act in accordance with their intentions. For example, Ajzen and Fishbein [4] reported a correlation of .85 between the intention to use birth control pills and use of birth control pills.

Nevertheless, Ajzen [3] acknowledged that there are two sets of factors that may cause the intentions of individuals to degenerate and, in turn, create discrepancies between initial intentions and subsequent behavior. The first factor that may attenuate the intention-behavior relation are events that occur in the period between the declaration of an intention and when the corresponding action needs to be taken. Such events may trigger changes in attitudes toward the behavior or the reactions of significant others toward engaging in the action, which, in turn, may lead to changes in intentions. The second factor that may weaken the intention-behavior relation is lack of commitment to the action. When individuals are weakly committed to an action, it increases the risk that the intention will degenerate over time.

In addition, we reasoned that subjective norm may impact the strength of the intention-action relation. On the one hand, when individuals plan to engage in a new action, the support of influential network members should have a strong impact on enactment of the intention. On the other hand, when individuals plan to continue with a previously engaged action, influential network members can be expected to exert less impact on carrying out the intention.

Hypotheses

The effect of intention (declared during a fall semester) on subsequent institutional departure (at the beginning of the following spring semester) is expected to vary with (a) semester GPA, (b) commitment, and (c) encouragement from others to stay.

Semester GPA as a moderator of the intention-departure relation. Semester GPA can be conceptualized as a life event that intervenes between the declaration, during a fall semester, of a persistence-related intention and persistence behavior defined in terms of enrolling for the following spring semester. Research by Bank and Biddle [7] demonstrated that grades were associated with shifts in intention to persist at the same institution. St. John et al. [37] reported that grades and long-range educational aspirations exerted a joint effect on persistence. For students with mostly "C" grades, as aspirations increased, persistence decreased. Mediocre grades may cause students with high aspirations to reevaluate their enrollment plans.

In the present study, we anticipated that for students who earn good (2.50–3.19 GPA) and excellent (3.20–4.00 GPA) grades, intention (to stay or to transfer) should be strongly related to institutional departure because the grades should not undermine their intentions. In contrast, fair grades (2.00–2.49 GPA) should undermine the intention of some students. For those who intend to transfer, fair grades may reduce the subjective probability of success at a four-year college, and for those who intend to stay, fair grades may reduce the subjective probability of success at their current college. Thus, intention should be moderately related to institutional departure among students whose grades are fair. For students who do poorly (< 2.00 GPA), the intentions of those who intend both to stay and to transfer are likely to be undermined. Consequently, intention should be weakly related to institutional departure among students with poor grades.

Commitment as a moderator of the intention-departure relation. Although some studies have found that full-time students are less likely to persist than part-time students [37,38], Okun, Weir, Richards, and Benin [30] observed that, as credit load increased, the association between intention and departure increased. For college students, higher credit loads are associated with a greater investment, and investment, in turn, is related to increased commitment to attending the same institution [29].

In the present study, commitment was assessed using a newly developed measure which tapped the priority students gave to doing well in college relative to their goals in noncollege roles. We expected that, when students assigned the highest priority to their grades, they would be most likely to enact their intentions. Thus, the relation between intention and departure behavior was predicted to be strong when doing well in college was the highest priority. In contrast, for students who made doing well in college their second or third highest priority, we expected that some of them would shift their intentions in the face of unforeseen events (e.g., job changes). Finally, for students who did not make doing well in college one of their three highest priorities, we predicted that the association between intention and departure would be weak. Such students lack commitment to the academic component of the college student role and hence should be most susceptible to shifting their intentions.

Encouragement from others to stay as a moderator of the intention-departure relation. Students who are planning to stay intend to continue with their current mode of behavior, whereas students who are planning to transfer intend to shift their current mode of behavior. Thus, despite low encouragement to stay, students intending to stay are expected to reenroll, whereas low encouragement to stay should lead to high departure rates among students intending to transfer. Consequently, intention should be strongly related to persistence among students with low encouragement to stay. High encouragement to stay should only fortify the intentions of students planning on staying. In contrast, high encouragement to stay should undermine the intention of students planning on transferring, because changing colleges often is contingent on the support of significant others. Consequently, intention should be weakly related to departure among students who are high in encouragement to stay. Table 1 summarizes the hypotheses of the present study.

Method

Sampling

We drew a random sample, stratified proportionately by day versus evening schedule, of sections of Introduction to Psychology offered at a community college located in the metropolitan area of Phoenix, Arizona. We selected 30 of 36 day sections and 10 of 12 evening sections. All instructors for these sections agreed to participate.

TABLE 1
Summary of the Hypotheses Related to Moderators of the Intent-Departure Relation

Moderator Variable	Effect on Intent-Departure Relation
H_1: Semester GPA	As semester GPA increases, the intent-departure relation will increase
H_2: Commitment	As commitment increases, the intent-departure relation will increase
H_3: Encouragement to stay	As encouragement to stay increases, the intent-departure relation will decrease

We administered the survey during class sessions between the 6th and 7th week of the fall 1991 semester. At the time the study was conducted, a total of 980 students were enrolled in the 40 sections of the Introduction to Psychology course. When the surveys were administered, 829 students (84.6%) were in attendance. Eight hundred and three students (97% of those in attendance) returned surveys to the instructors.

Respondents were compared on gender, ethnicity, age, credit hours completed for the fall 1991 semester, and semester grades with the population of students currently enrolled in the Introduction to Psychology course. Chi-square tests indicated that, relative to the population of Introduction to Psychology students, students who returned the survey did not differ significantly ($p > 0.05$) with respect to gender, χ^2 (1) = 0.00, ethnicity, χ^2 (1) = 0.66, and age, χ^2 (1) = 1.07. However, participants in the survey were significantly ($p < 0.001$) less likely than the population of Introduction to Psychology students to have completed 0 credit hours for the fall 1991 semester (1% versus 5%), χ^2 (1) = 28.74, and to have earned a semester GPA less than 2.00 (19% versus 27%), χ^2 (1) = 15.43. Thus, the sample compared with the population of community college students was somewhat biased toward students who earned some credit hours and at least a "C" average. Metzner [22] also found that students enrolled in few courses and students who had lower GPAs were underrepresented in her sample.

Students were excluded from the study if they indicated on the survey that they were receiving a certificate or a degree at the end of the fall 1991 semester ($N = 40$) or if their student identification number was missing or inaccurate ($N = 42$). Of the remaining 721 students, 621 students (86%) indicated that they intended to stay, 90 students (13%) indicated that they intended to transfer, 9 students (1%) indicated that they intended to stop out, and 1 student did not indicate his or her intention. We excluded students who intended to stop out and the student whose intention was not indicated. A total of 652 students completed all items on the survey related to this study.

Limitations of the sample. The sample for the present study has a few limitations. First, the sample was drawn from a single institution. To generalize the results of the hypotheses tested in this study, the findings will need to be replicated with samples drawn from other community colleges as well as four-year colleges and universities. Second, the base rates for intention to transfer and institutional departure were relatively low. To increase the number of students in our sample in these categories, we included 83% of the population of sections for the Introduction to Psychology course.

Variables and Measures

Students recorded their responses on an IBM response sheet. Because the response sheet had five options, some interval level variables were measured on ordinal scales. All survey items and response options had been used in a previous study [29] except for grade priority.

Commitment. Commitment was assessed by having students indicate the priority assigned to doing well in college compared to the most important medium-range goals in six other areas of life (work, leisure/travel, health/fitness, financial/material, family/home life, and social relationships). Medium-range goals were selected in order to make the nonacademic goals comparable in scope to the goal of doing well in college. Students identified their most important noncollege-related goal within each area. If students had no goals in an area, they wrote "not applicable." From this list of goals and the goal of doing well in college, students selected their first, second, and third most important goals.

Two dummy variables were created. Commit1 equals 1 if college was the student's highest priority (45% of the cases), and Commit2 equals 1 if college was the student's second or third highest priority (43% of the cases). The default group consisted of students for whom college was neither first, second, nor third highest priority (12% of the cases). We created dummy vectors to allow us to examine whether commitment has a linear or nonlinear impact on college departure.

GPA. From the student information system, we extracted information about semester GPA for the fall 1991 semester. The mean was 2.70 with a standard deviation of 1.02. Because we felt that GPA might exert a nonlinear effect on institutional departure, we created a quadratic term (GPA2). We used the continuous variable GPA rather than creating categories to retain as much information as possible, and because the community college involved in the present study does not dismiss students or put students on academic probation because of low GPA. Therefore, we did not anticipate a large effect of a certain GPA level (say 2.00) on student retention that might occur at a four-year college or a community college with an academic dismissal policy. To reduce collinearity between GPA and GPA2, the GPA term was centered (mean = 0) before it was squared [1].

Credit load. Credit load has been found to have a nonlinear effect on retention; greater persistence rates are associated with increases at the lower rather than the upper end of credit load [36]. Because credit load was measured on a 1–5 scale from the student survey, with an open-ended response code at the top (12 or more hours), a quadratic term, using either the 1–5 ordinal scale or the class midpoints, would be inappropriate. Therefore, we created two dummy variables to represent the nonlinear relationship. The default category is taking 3 hours or less (minimal enrollment = 7% of cases), and the first dummy variable represents taking 4 to 11 hours (part-time = 33% of cases), while the second represents taking 12 or more hours (full-time = 59% of cases).

Other control and predictor variables. Gender, ethnicity, and marital status were measured as dummy variables (with male, white, and married coded one). Forty percent of the cases are male, 83% are white, and 17% are married. Age, hours worked, responsibility for children, and certainty of finances are control variables measured with 4- and 5-point scales that are treated as interval variables. The modal age was 19 or under; the median hours worked was between 21–30, 77% of respondents had no children, and most respondents felt very certain of finances. These variables were included in preliminary tests of the base model as they have been linked to institutional departure in the literature. Encouragement from others to stay at community college is operationalized by a single-item statement "Most people who are important to me think that I should enroll at GCC in the fall." This item was measured on a 4-point scale in which 1 equals strongly disagree and 4 equals strongly agree (M = 3.3). Enrollment intention for the next semester was measured by a dummy variable with 1 indicating intention to stay and 0 indicating intention to transfer. Eighty-seven percent of respondents indicated that they intended to stay for the next semester.

Dependent variable. Our outcome variable, institutional departure, was extracted from the student information system. It was determined by the actual enrollment status of the student at the beginning of the spring 1992 semester. Departure was coded 1, and reenrollment was coded 0. The base rate for institutional persistence was 77%. Among students who intended to stay, the institutional persistence rate was 81%. In contrast, among students who intended to transfer, the institutional persistence rate was 50%.

Limitations of the measures. The variables and measures for the present study have a few limitations. First, we did not take into account the number of hours students had previously earned at the community college. However, it should be pointed out that students who anticipated receiving a degree from the community college were screened from the sample prior to the analyses. Second, some information was lost because several of our control variables were measured on ordinal rather than on interval scales. This limitation was offset, in part, by eliminating potential errors introduced by manual entry of data. Third, we were unable to follow up students who departed the institution to determine whether they transferred or stopped out. Therefore, we refer to our dependent variable as a measure of institutional departure.

Results

Logistic Regression Analysis of Institutional Departure

Main effects model. We decided to limit the inclusion of control variables in our models so that tests of our hypotheses could be done with as simple a base model as possible. Thus, we first estimated an equation predicting institutional departure by the control variables: student's age, gender, ethnicity, marital status, responsibility for children, work hours, credit load and certainty of finances. In this equation, only credit load and certainty of finances were significant predictors of institutional departure. Thus, only these two variables were included in subsequent models. Next, we generated a main effects model which included these two control and our four predictor variables, grade point average, commitment, encouragement, and enrollment intention. The –2 log likelihood (log L) statistic for the model ($df = 8$) was 518.93.

The –2 log L statistic provides an indication of the fit of the model with smaller values indicating better fitting models. The utility of adding terms to a model can be evaluated by whether the reduction in the –2 log L statistic is significant [16, 21]. Changes in the –2 log L are distributed as chi-square with the degrees of freedom equal to the number of terms added to the model. Because we anticipated a curvilinear relationship between GPA and departure, we compared the preceding model with a model which included the curvilinear term, GPA2. The –2 log L statistic for the new model ($df = 9$) was 512.71. Because the –2 log-likelihood reduction = 6.22 ($df = 1$) was significant ($p < 0.05$), GPA2 was retained for the main effects model. In testing our interaction effect hypotheses, we always controlled for the effects of credit load, certainty of finances, GPA, GPA2, commitment, encouragement to stay, and intention.

Hypothesis 1. Our first hypothesis predicted an interaction between semester GPA and reenrollment intention such that as GPA increases, the impact of intention on departure increases. In addition, because the curvilinear term, GPA2, was significant, we also examined whether there was a significant interaction between GPA2 and intention. First, we tested the GPA2 by intention interaction term [1, 35]. Above and beyond the main effects model, this term did not significantly reduce the chi-square fit and was dropped from the equation. Second, we tested whether the linear portion of GPA interacted with reenrollment intention. The addition of this term also did not significantly reduce the chi-square fit, so we must conclude that GPA does not moderate the effect of intention on institutional departure.

Hypothesis 2. The second hypothesis states that as commitment increases, the intention-departure relation increases. We tested this hypothesis by adding interaction terms for intention with both commitment dummy variables to the main effects model. These interaction terms produced a significant improvement of the model. The –2 log L change was 7.158 (*df* = 2) which is significant at the 0.05 level.

Hypothesis 3. The third hypothesis states that as encouragement to stay increases, the relation between intention and departure decreases. To test this hypothesis, the interaction term for encouragement to stay by intention was added to the main effects model. This interaction significantly improved the chi-square –2 log L fit of the model at the 0.05 level of significance. The –2 log L change was 5.206 (*df* = 1).

Hypotheses 2 and 3 were supported when each was tested separately. To assess whether the commitment by intention interaction terms and the encouragement to stay by intention interaction term were significant when tested jointly, we included them in the same model. We found that both interactions effects were significant when considered simultaneously. Furthermore, in comparison to the model that included the main effects and the commitment by intention interaction terms, the addition of the encouragement to stay by intention interaction term significantly improved the fit of the model at the 0.05 level. The –2 log L change was 5.906 (*df* = 1).

Indicators of overall fit. Table 2 provides several indices of the overall fit of the equation. The model chi-square of 196 gives the amount of reduction in the chi-square from a logistic equation containing only the y-intercept. This improvement is significant at the 0.01 level of significance. Eighty-three percent of the cases are correctly classified. With our model, 94% of the students who return and 46% of students who depart are correctly classified. Although our model only improves the accuracy rate for classification by 6% over the base rate (77%), the 6% improvement is substantial insofar as it represents 26% of the maximum possible improvement. Most importantly, whereas using the modal frequencies none of the students who depart would be classified correctly, we were able to classify correctly 46% of these students. The Somer's *D* measure of association for the classification table is 0.67.

Logit coefficients, changes in probabilities, and plots. Table 2 presents the logit coefficients for the model that contains the main effects and the significant interaction terms. Changes in probabilities (delta-*p* statistics) are presented for significant logit coefficients [37]. For dichotomous predictors the changes in probabilities indicate the extent to

TABLE 2

Logistic Regression Coefficients for Institutional Departure (and Change in Probability for Significant Regression Coefficients)

Variable	b	Change in Probability
GPA	–0.625**	–0.09
GPA2	0.204*	0.04
Credit Load		
Part-time	–1.527**	–0.17
Full-time	–2.581**	–0.20
Intent[a]	–3.458**	–0.22
Commitment		
Commit1[b]	–0.281	
Commit2[c]	–1.151	
Encouragement	–0.773**	–0.11
Certainty of finances	–0.227	
Commitment × Intent		
Commit1 × Intent	–0.96	
Commit2 × Intent	0.731	
Encouragement × Intent	0.682*	0.14
Constant	5.224**	

Model chi-square 196.338 ($df = 12$), $p < 0.01$

Percent of cases correctly classified with model = 83%

94% of students who reenroll correctly classified

46% of students who depart correctly classified

Somer's $D = 0.67$

[a] Intent, 1 = stay, 0 = transfer.

[b] Commit1, 1 = Doing well is highest priority, 0 = other.

[c] Commit2, 1 = Doing well is second or third highest priority, 0 = other.

* significant at $p < 0.05$ ** Significant at $p < 0.01$.

which the outcome is likely to differ if the individual has a value of 1 as opposed to 0 on the dummy variable. For continuous predictors the delta-*p* statistic indicates the extent of change in the probability of the outcome occurring per unit change in the predictor variable.

Several points are worth noting in this equation. First, both GPA and its square are significantly related to institutional departure. The change in probability for the linear term is negative, indicating that as GPA increases one point, the probability of institutional departure decreases 0.09. The logit coefficient for the curvilinear term is positive, indicating that the negative slope becomes less steep as GPA increases. To clarify the curvilinear effect, the probability of institutional departure was plotted against fall semester grade point average. All interval-level variables were held at their mean while all categorical variables were held constant at the modal category. Thus, this equation is the plot for those who intended to stay, carried high credit loads, and had high commitment to doing well in college and who were at the mean on certainty of finances and encouragement from others to stay. As can be seen in

Figure 1, the effect of GPA on probability of departure is quite strong from the 0.00 through the 2.00 range. After students have achieved a 2.00 average, increases in GPA have relatively little impact on the probability of departure.

Table 2 also gives the logit coefficients and their associated change in probabilities for credit load which we also expected to have a nonlinear effect on institutional departure. Both of the logit coefficients for credit load are negative. Examining the change in probabilities, it is found that compared to students taking a minimal one-course load, students taking a larger part-time load have a 17% lower chance of departure, and students carrying a full-time load have a 20% lower chance of departing from the institution.

Intention to remain at college interacts with both commitment to doing well in college and encouragement to stay at college. Therefore, the impact of intention on institutional departure can only be assessed within the categories of the other variables. When interactions occur, it is useful to plot the interactions in order to clearly see the direction of the effects [21]. Figure 2 shows the interaction of commitment to doing well in college with intention. For students in the high commitment category, intention has a powerful effect on the probability of departure. While the probability of departure is only 0.04 for those who intended to stay, it is 0.27 for those who intended to transfer. For those for whom college is only a medium priority, there is little difference in the rate of actual departure between those who intended to transfer (0.14) and those who intended to stay (0.09). Few students had low commitment to doing well in college so the impact of intention on institutional departure within this group is only suggestive. However, contrary to the

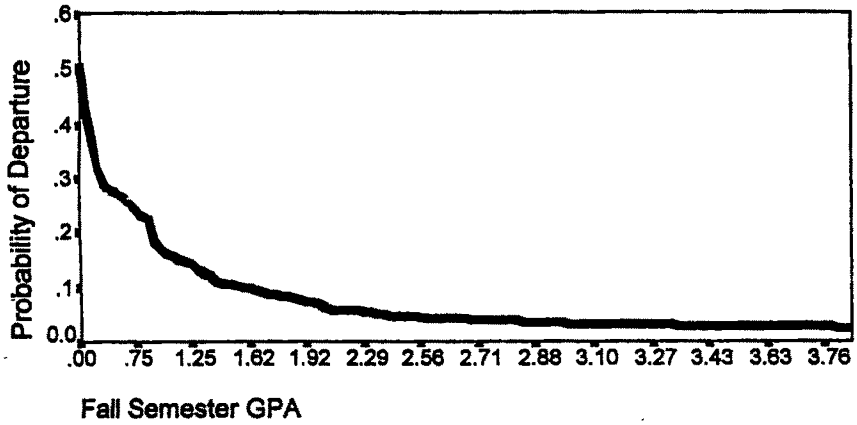

FIG. 1. Probability of Departure by Fall Semester GPA

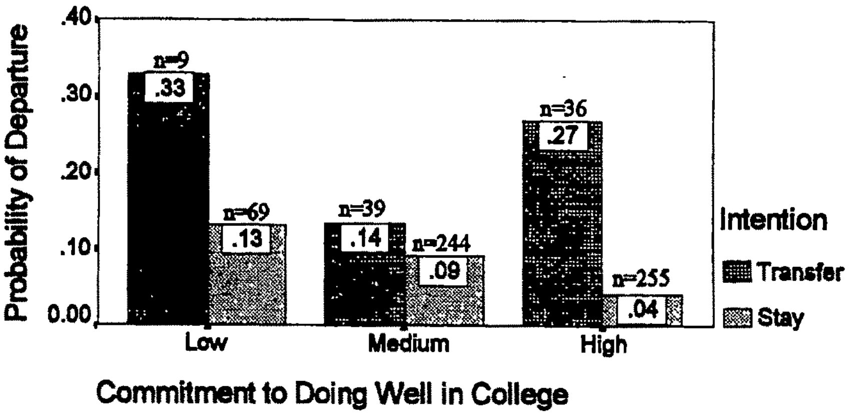

FIG. 2. Probability of Departure by Commitment and Intention

second hypothesis, the low commitment group displays a large difference in actual departure according to students' intentions.

Figure 3 shows the dramatic impact of the interaction between encouragement to stay at the college and intention. For those who intended to stay, encouragement to stay has virtually no effect on the probability of enrollment. However, among those who intended to transfer, there is a powerful impact of encouragement to stay on actual departure. As encouragement to stay decreases, students intending to transfer are much more likely to depart.

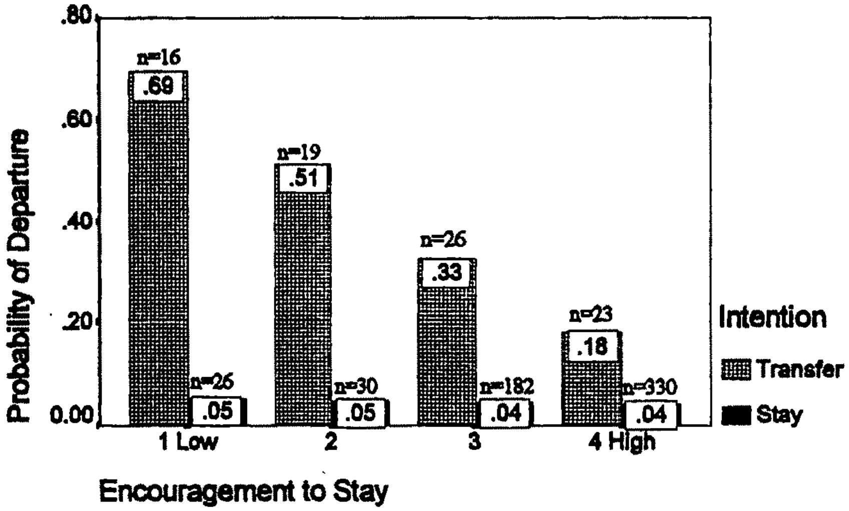

FIG. 3. Probability of Departure by Encouragement to Stay and Intention

Conclusions

The present study was an initial investigation of the joint effects of enrollment intention and grades, commitment, and encouragement to stay on institutional departure from college. The findings of the present study, in conjunction with previous research [29, 30], indicate that the intentions of community college students often degenerate over periods ranging from 14 to 23 weeks. On the one hand, for students intending to stay, departure rates have ranged from 18% to 29%. On the other hand, for students intending to transfer, persistence rates have ranged from 18% to 50%. Our findings indicate that for students who intend to stay and to transfer alike, credit loads of 1-3 hours and semester GPAs below 2.00 are associated with increased risk of institutional departure. Furthermore, the intention to transfer appears to be undermined by high encouragement to stay and by moderate commitment to the goal of doing well in college. Below we comment on each of the findings.

Grades. Contrary to the first hypothesis, the life event, poor academic performance, did not moderate the intention-departure relation. One possibility is that nonacademic events such as work events and family events attenuate the relation between intention and institutional departure.

We did find a nonlinear effect for semester GPA. However, there were differences in the form of the nonlinear effect observed in the present study and in previous research [37, 38]. Specifically, whereas St. John et al. reported that students with below "C" averages had the highest rate of persistence, we found a positive relation between semester GPA and persistence in the 0.00 to 2.00 range. Perhaps, differences in institutional policies regarding academic withdrawal account for the discrepant findings. In many colleges, students who withdraw in low academic standing during the middle of the academic year are penalized [37], whereas no sanctions were employed by the college used in the present study. In the absence of penalties for withdrawal, students with poor grades may have few incentives to persist for the next (i.e., spring) semester.

Commitment. In support of the second hypothesis, the intention-departure relation was higher among students who place a high priority on doing well in college as compared to students who place a moderate priority on doing well in college. A moderate as opposed to high priority on doing well in college may contribute to "unintended" persistence among students intending to transfer. Surprisingly, the intention-departure relation was also strong among students who place a low priority on doing well in college. Because only 9 students both intended to transfer and assigned a low priority to doing well in college, the findings for this group must be considered tentative. Although students who intend to transfer are equally likely to leave the institution whether they are low or high in commitment, students low in commitment may be more likely to stop out, whereas students high in commitment may be more likely to carry out their intention to transfer. Tests of this explanation will require a longitudinal design in which a large sample of students who intend to transfer are tracked to determine whether they subsequently reenroll, transfer, or stop out.

As Bean and Metzner [9] and Spanard [39] noted, nontraditional (older, part-time, commuter) college students may be more impacted by factors exogenous to the college environment than traditional college students. Our notion and measure of commitment differs from previous work in that it focuses on the relative priority of educational goals. Thus, our approach to assessing commitment requires students to take into account what is happening in their life space outside of the college environment.

Encouragement from others to stay. In support of the third hypothesis, among students who intended to transfer, encouragement from others to stay exhibited a strong, inverse linear relation with institutional departure. Significant others may have several reasons for encouraging students to reenroll at community colleges as opposed to transferring to a four-year college. For example, parents who control the purse strings for young students may prefer the community college because of financial considerations. Mates and significant others who must negotiate family and work responsibilities with mature students may prefer that their partners enroll at the community college because of flexible scheduling. Future research could examine the influence of different sources and types of encouragement to stay and encouragement to leave on institutional departure [8].

When encouragement to stay is high, over 80% of students intending to transfer subsequently returned to the same college. Therefore, encouragement to stay may play a substantial role in "unintended" persistence among students intending to transfer. Because failure to transfer from a community college to a four-year college or university is one key to the "leaky pipeline" [6], we need to understand how encouragement from others to stay contributes to students' shifting their intention from transferring to staying. Moreover, it is important to determine whether postponing transferring and reenrolling at the same institution has any long-term positive or negative consequences for community college students.

Credit load. We found that students enrolled for three or fewer credit hours were much more likely to depart the institution than students enrolled for four or more credit hours. Richards [36] reported a similar finding at a different community college, although St. John and colleagues [38] observed that full-time students at community colleges were more likely than their part-time counterparts to depart the institution. Our findings are consistent with investment theory, which postulates that individuals with the smallest investment (i.e., credit load), are most likely to leave an organization [20]. Strategies such as paired courses may promote institutional persistence among students planning on enrolling for a single course.

In conclusion, in the present study, precollege variables such as gender, age, ethnicity, marital status, number of children, and hours working did not have direct effects on institutional departure. Consistent with the conclusion drawn by Pascarella and Terenzini [34], the power of our model was derived from the college variables of credit load, semester GPA, commitment, encouragement from others to stay, and intention. Similarly, Cabrera et al. [18] demonstrated that intention, grades, encouragement from others, and institutional commitment played a prominent role in institutional departure.

St. John and Starkey [38] accurately classified 78% of the cases using social background, financial background, college characteristics, undergraduate experience, aspirations, and costs as predictor variables. In the present study, we were able to classify accurately 83% of the cases (94% of returning students and 46% of departing students). Clearly additional research is warranted on the determinants of institutional departure. In particular, predictors need to be identified that enhance our ability to classify accurately students who subsequently depart the institution.

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Book Reviews

American Higher Education: A History, by Christopher J. Lucas.
New York: St. Martin's Press, 1994. 316+ pp. $39.95 ($15.95)

HAROLD PERKIN, Northwestern University

American higher education has long outpaced the rest of the world in the number of its institutions (some thirty-five hundred), students (14.2 million), and faculty (about 2 million), in the age participation ratio (over half the relevant age group), the percentage of women (53 percent), the openness of its doors to minorities and poorer classes, and in its ability to provide, in Ezra Cornell's immortal words, for "any student, any subject." More than that, it leads the world in innovative research and the number of Nobel prize winners. Why, then, is it so discontented?

The answers to this paradoxical question go back to the beginnings of its history, and Christopher Lucas's ninth book pursues them down the centuries. Perhaps he goes back too far: the first third of the book is not about American experience but about its antecedents, as far back as ancient Mesopotamia, Egypt of the Pharoahs, and Greece of the Sophists. In Part 1 he takes us through the well-worn saga of ancient academies and lyceums, the founding of true universities in the High Middle Ages, and their decline into moribund routine in early modern Europe, to be rivaled by the new academies of the Scientific Revolution. He ignores the struggle between Empire and Papacy, which gave them a tiny space for intellectual independence. He mentions the Reformation, but says nothing about the seismic contribution of the universities to that enormous shift in the intellectual tectonic plates, or the religious wars that provoked a new wave of competing universities into existence, before they declined into moribund routine.

The American experience, owing much to its European roots, can nonetheless stand by itself. Part 2, on the colonial and antebellum period, tells how the early colonists, after building their houses and churches and settling their civil government, felt the need "to advance learning and perpetuate it to posterity" [104] each college teaching its own intolerant theology. The liberal or general education they provided, chiefly in the classics and mathematics, also offered a foundation for other learned professions and gave America the edge on the old, aristocratic continent and its increasingly obsolescent universities.

Part 3 deals with the period after the Civil War, when American education took a great leap forward, borrowing the idea of the research university from Germany but transmuting it from the individual professor's seminar into the mass-production system it became by the twentieth century, exactly parallel to the rise of the corporation in business. It was then that the American model began to pull ahead, with increasing resources devoted to scientific discovery and innovation.

This led to agonizing self-questioning about general versus specialized education and between traditionalists who favored a canon of "great books" and reformers who looked to the university as the powerhouse of economic growth. It also led, beginning before World War II, to the pressures for conformity from the wider society, which came to a head in the academic witch hunts of the House Un-American Activities Committee, set up in 1938 but reaching its destructive triumph under Senator Joseph McCarthy in the 1950s, when scores of professors were hounded out of academe. Government and the big business corporations, which increasingly funded the universities, whether public or private, began to demand agreement with their aims and ideals. Such threats to academic freedom brought the American Association of University Professors into existence and its black list of offending institutions. The student backlash of the 1960s challenged these demands, led by young people who paradoxically benefited most from the free market system.

All these deep-rooted conflicts come to a head in Part 4, much the best part of the book, which deals with the many discontents of contemporary academe: education for life versus training for careers; elitism versus egalitarianism; traditional Western culture versus multiculturalism and "political correctness"; affirmative action for African Americans and other minorities versus "a level playing field" for the fortunate majority; grade inflation in a system where students who have paid big bucks believe they deserve what they paid for; the careerism of academics who must "publish or perish" to the neglect of teaching and loyalty to their institutions; the consequent loss of community when a university becomes a congeries of discrete disciplines; and the fragmentation of intellect when knowledge disintegrates into solipsistic postmodernist social constructions which, taken to extremes, would make the university redundant. In assessing the recent literature on our present discontents, Lucas has performed sterling service, and provided a sound base for the necessary further discussion.

The irony of all this lamentation, however, is: (1) higher learning has always been disputatious and its goals and methods have always been contested — the medieval university can be said to have begun with Abelard's dialectical method of *sic et non,* thesis versus antithesis, the battle of opposites; and (2) the American university, despite — or because of — its discontents, still leads the world in the mass production of graduates, professional specialists, research and innovation. If life is conflict, preferably civilized competition, then the university is as good a preparation for it as one is likely to find in an imperfect world. A free market in ideas is what John Stuart Mill, that unfashionable liberal, thought was the high road to a provisional and flexible truth. The university was born in the intellectual interstices between two despotic systems, the secular monarchy and the heretic-hunting church. The danger now is that it will be squeezed between two equal oppressors, the overmighty state and the overbearing business corporation. A little more space between the two would seem to be higher education's best hope of freedom, not only in America but in the whole postmodern world.

Higher Education and Corporate Realities: Class, Culture, and the Decline of Graduate Careers, by Philip Brown and Richard Scase. London: UCL Press Limited, 1994. 179+ pp. (Distributed by Taylor and Francis, Bristol, PA) $65.00 ($24.95)

JOHN S. HEYWOOD, University of Wisconsin-Milwaukee and University of Birmingham

Two fundamental changes in Great Britain (and, indeed, mirrored in the United States) suggest increasing opportunities for those often excluded from professional and managerial careers. First, British higher education expanded rapidly from the 1960s to the 1990s with the number of students increasing fivefold and the participation rate increasing threefold. Second, the highly publicized adaptive workplace is replacing the bureaucratic paradigm. This new kind of workplace centers on teamwork, flatter hierarchies, receptivity toward ideas from every part of the organization, and less emphasis on explicit rules. Thus, the new graduates, often women and minorities, should expect to find a more receptive work environment that values their talent and does not prejudge them. Brown and Scase forcefully argue that this conclusion is not only unwarranted but even contrary to what actually occurs: the adaptive workplace is more likely to exclude the new graduates from the fast-track careers that they seek.

An increasing pool of university-educated workers shifts the emphasis from valuing an education to placing value on where that education was obtained. The newer universities and the old polytechnics, though responsible for much of the student growth, cannot command the attention of Oxbridge or even the Victorian civic universities in the hiring plans of adaptive workplaces. The heightened value of working in a team, communicating with those already in the organization, and providing leadership means that *social* qualifications gain at the expense of soon outdated technical qualifications. This increased premium on cultural capital focuses recruitment away from the new students and toward those whose social qualifications reflect the financial resources spent early and often by their families. This may be especially true when a worker receives a short-term, project-oriented commitment from a company rather than an implicit lifetime contract. The organization is only interested in a "sure bet." Thus, the authors argue that the emergence of the adaptive workplace serves to help reproduce and perpetuate class divisions, as the elite prepare their children for an Oxbridge education that reinforces the very cultural attributes valued by the new workplace and ones that no amount of technical training can replace.

The research designed to support this hypothesis flows from a series of interviews. The first series of interviews questioned students at three representative universities: Oxbridge, a newer comprehensive university, and a polytechnic (all now integrated into a single university system). The responses reveal a rigid hierarchy among these schools, which the students think follows largely from what happens outside the classroom. The opportunity to develop social skills in crew or debate together with the valuable networking that this experience provides cannot be reproduced by students who live at home and work part time, no matter how hard they work in the chemistry lab. The interviews also reveal that most students across all three universities are conformists who hope for a career. The second set of interviews solicited responses from thirty recruiters working for large and medium-sized organizations. The attributes prized by these recruiters go beyond academic standing and can be summarized as a requirement that applicants "make the social grade." The final set of interviews was again directed to the original group of students, who by then had graduated, and sought to probe their attitudes about their current employment. The results of these interviews confirmed that the students who had adapted best to the new workplace paradigm were those who had attended Oxbridge and, in addition, that most of the workers exhibited little or no loyalty to their employer. The authors interpret these findings as a natural result of the "decline of careers," the short-term nature of employment relations in the adaptive workplace.

Obviously, Brown and Scase tackle a complex social interaction of the competitive marketplace, the process of hiring, the process of schooling, and the role of class. It is to their credit that they can present a logical case in under two hundred pages. Yet, much of the logic rests on a debatable foundation of facts and theories. First, the paradigm shift in the workplace appears open to question. Certainly, the rhetoric has changed dramatically, but the core numbers show little change. Burgess and Rees (1994) indicate that in 1975 the average years of tenure with an employer in the United Kingdom was 10.4 years for men and 6.3 years for women; in 1993 the averages were 9.5 years for men and an identical 6.3 years for women. The pattern of a typical working life remains roughly stable, and large portions of the work force still enjoy a "job for life." The extent of the workplace shift, in fact rather than in rhetoric, deserves scrutiny. Second, the notion that education serves as a form of social exclusion is incomplete; it also serves as virtually the only mechanism of social mobility. Moreover, it seems clear that part of the mobility flows from the lessons that education actually teaches, not just from its ability to exclude others. Economic research in the United States indicates that identical twins, raised in the same households attain very different achievements in the labor market after having received different schooling (Ashenfelter and Krueger, 1994). Such research goes toward holding both nature and nurture constant and therefore indicates that education imparts value not just filters. Third, much of the authors' hypothesis rests on a suggestion that increasing competition, perhaps responsible for both downsizing and the new workplace paradigm, naturally leads to hiring the "safe bet" white male. Though this link is not defended by the authors, it is interesting to note that more competitive industries are often given credit for less discrimination (Peoples, 1994) because they can less well afford to "waste" talent.

On the methodological front, the reader is presented with no detail about the interviews that stand at the center of this text. The design of the survey instruments, the exact questions asked, the method of sampling, and the process of editing are largely unmentioned. This leaves the impression that the interviews could be a wishing well in which one sees what one wants.

In the end none of these concerns may be fatal to the value of the book. The authors propose a hypothesis with enough resonance and disturbing implications that it deserves additional study. In this case a good question may be as valuable as a good answer.

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